MOTOR AGE

Vol. XXX
No. 8

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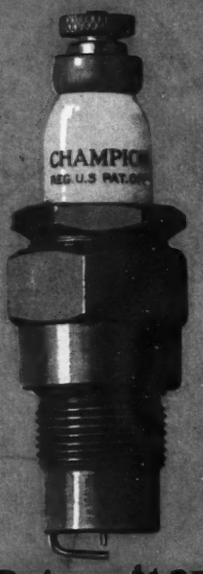

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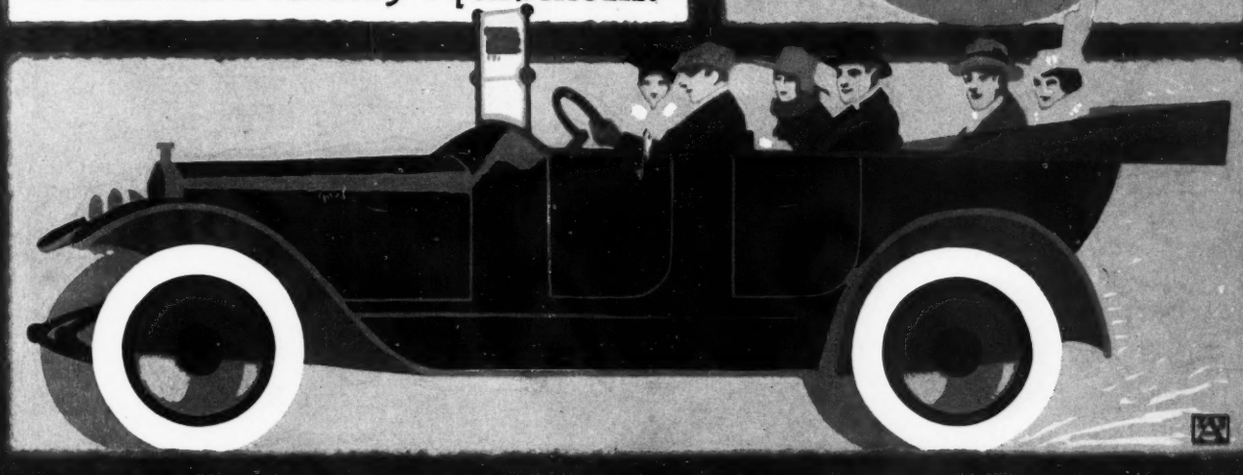

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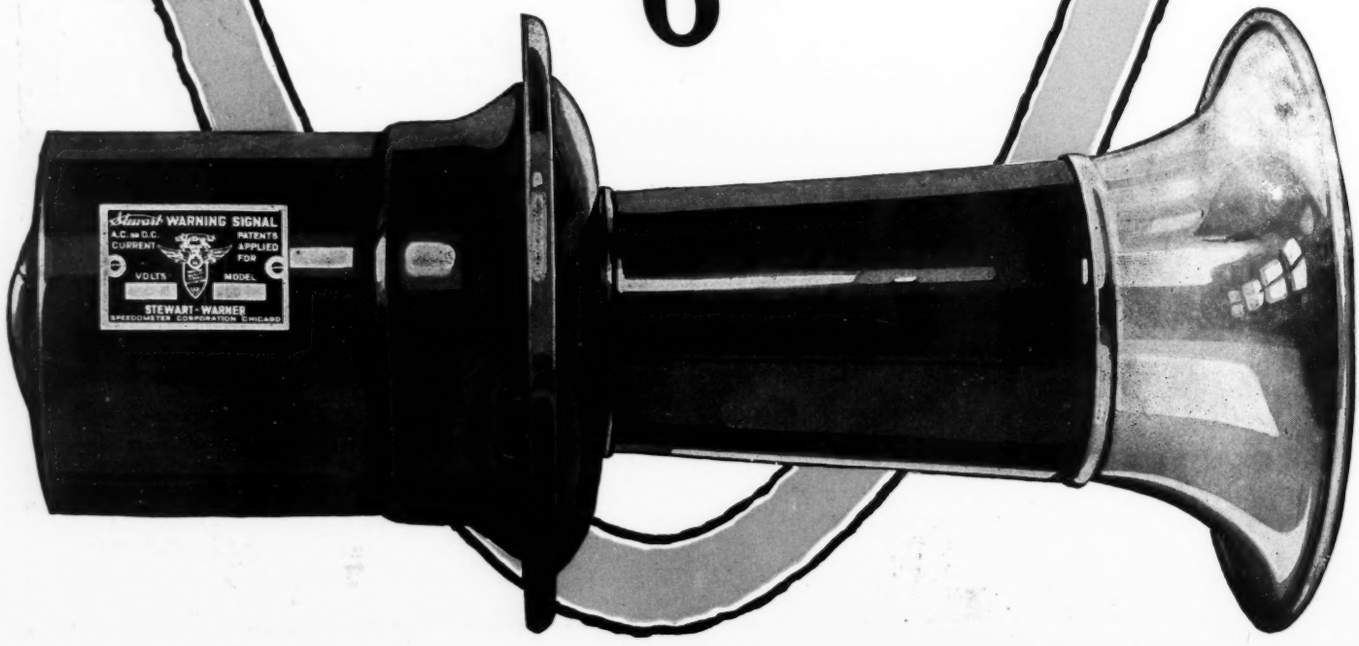

MOTOR AGE

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ANNOUNCEMENTS

"Manila—Center of Good Roads," which will be the feature of Motor Age for August 31, will outline road conditions and touring possibilities in the Island of Luzon.

Uniform Traffic Rules

You know traffic rules!

You may be familiar with traffic rules in your own home city, but how about those in the other cities to which you more or less frequently go? Ten to one they are Greek.

Why?

Because there is no uniform traffic regulations in different cities. There are almost as many different traffic ordinances as there are different cities and the motorist who does any touring cannot memorize them all.

There's a reason—

And a very good one why every city should have a traffic ordinance that in practically all respects is identical with the rules governing traffic in all other cities. With uniform traffic rules in force throughout the country, accidents will be less frequent, for every driver of a car knows at least one traffic ordinance, and if there **is but one in force** he will be familiar with the fundamental principles governing his movement through any city and conforming with the rules of each.

Motor Age

believes uniform traffic regulations are feasible and necessary. Motor Age is preparing a campaign for bringing this about. A model set of traffic rules that will apply to any city from 2,000 up will be put before the public. Watch for this series. The opening shot will be fired in a few weeks.

Studebaker Opportunities

Another in Kentucky

IT'S the second largest city in the state, located on the Ohio River and connected by a suspension bridge with one of the leading cities in Ohio. In fact these two centers might easily be called "the twin cities of the South", so closely are they bound by the ties of business and friendly relationship.

In this city of over 55,000 people Studebaker has an opportunity for a "live-wire" dealer to go in with the Studebaker line and build a lasting and profitable business. Current reports indicate that this city was never more prosperous than at present.

Water and rail transportation afford excellent facilities for the development of its chief industries comprising cigar and tobacco factories, foundry, machine shops and flour and steel mills.

Rarely has Studebaker been able to offer such a splendid opportunity as this in the South. It won't "go begging" long, that's sure. If you are interested, don't delay but write for the facts immediately.

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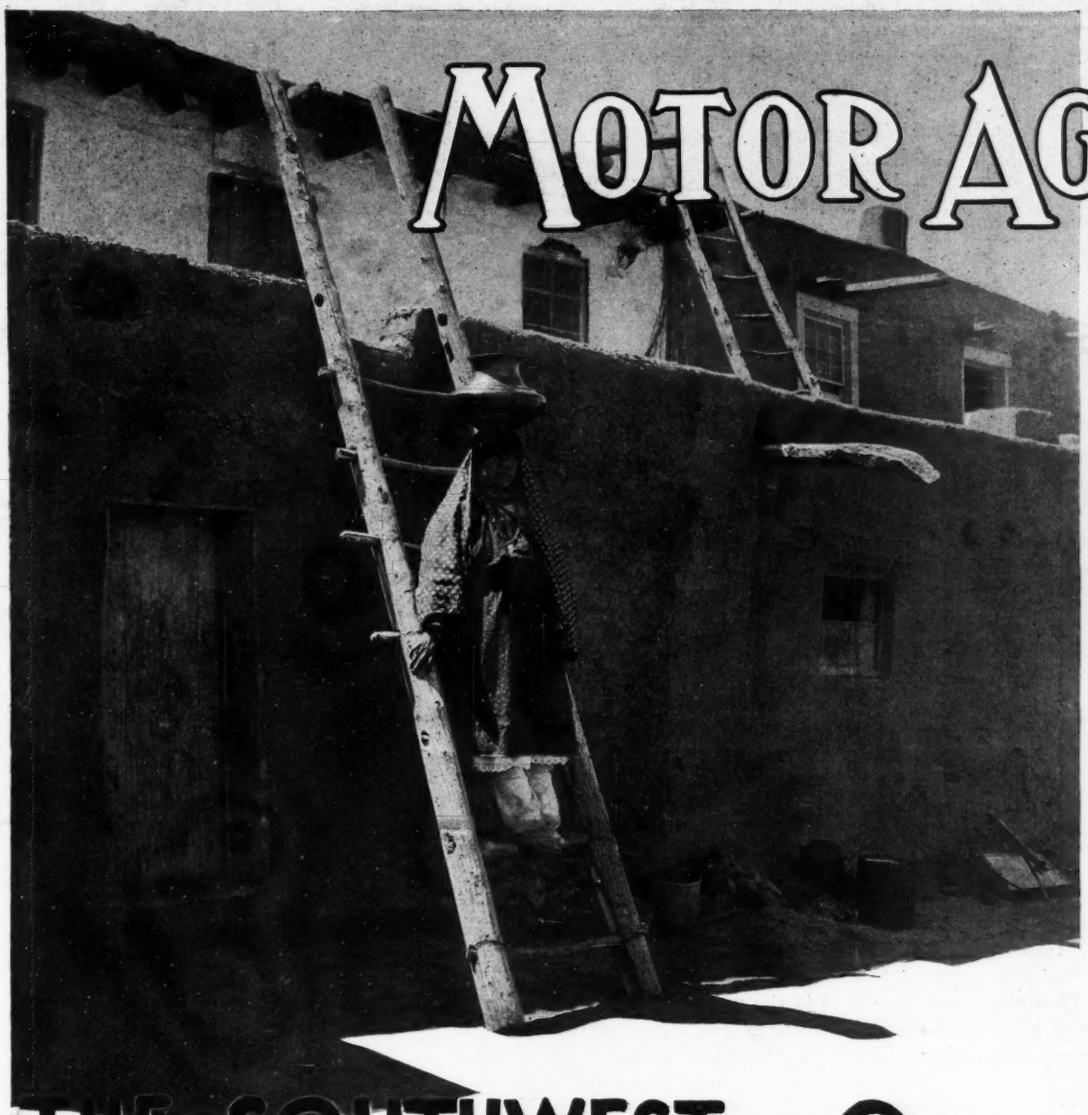
MOTOR AGE



Doors and windows have appeared in the Pueblo's dwellings since the Pueblo woman adopted the prints of the white settlers, but the stairway is still outside, and the women still go up and down, carrying water to the communal homes within. Not so long ago there were no doors and windowpanes, for the Pueblo was slow to adopt them. Entrance was by ladder and trapdoors in the roofs. The bolt was drawn as the ladders were lifted, and the householder dared his foes. He prepared his protection as the cliff-dwellers did

THE SOUTHWEST — Our Quaint Aboriginal Corner

by Ruth Sanders

In Two Parts—Part I

LET the motorist who seeks to know the wonders of the Southwest forget the warpath-treading, scalp-raising Indian of the novels and the wild west shows when he visits the Pueblo in his apartment home among the mesas. For the Pueblo, strange as it may seem, never engaged in a war against the United States; nor has he been a savage these many centuries, but a scion of a most ancient civilization.

The Pueblo region is around Albuquerque and Santa Fe in New Mexico, though the country of the snake dance is reached also from points on the main highway as it crosses Arizona.

Not more than 5 hours' motoring from Santa Fe is Taos, the most ancient city, and between Taos and Santa Fe are other pueblos. The good roads activity in New Mexico has brought good touring conditions to that section. A reasonable amount of care insures the motorist against trouble. The road west of Santa Fe—to Albuquerque and on—is excellent. Modern roadbeds and switchbacks have been constructed.

A road from Albuquerque west leads to Gallup, from which the Zuni and the Moqui can be reached. In the rainy season, the motorist may find it better to follow the main highway westward to Springerville and Holbrook and on before visiting these two tribes. But local inquiry will inform him as to the necessity for any detour. As a rule, travel from Albuquerque to Gallup is possible.

A strange corner of the world is this, our unknown Southwest, and the motorist well can take a few days off for trips to the aboriginal villages, if he is to realize fully the glories of an American Sahara and an Occidental Orient on his own hearthstone.

Up from Santa Fe, on a road which winds northward to Taos, the wonders of wide,

The cobbler works in his doorway as his ancestors did before him

A strange corner of the world is this where the road leads to the desert and to the homes of a past civilization

open spaces and ragged horizons wait.

Set in the splendor of the Rockies, their sides splashed with groves of aspen, at the foot of the mountains, where one canyon, the Glorieta, starts a stream of sparkling water out into the plain, lies Taos.

Wild roses, wild plum trees and clambering clematis edge the last mile of the road. Openings in this summer hedge reveal little fields of wheat and tasseled corn, fringed with purple asters and yellow sunflowers, while bareheaded Taos men work, their blankets wrapped about their waists and falling to their knees, resembling skirts.

In the Old Days, Taos was the watch tower on the outskirts of the wilderness. Here Kit Carson and other famous frontiersmen came to barter beads and calico and tobacco and firewater for hides and fur and native-woven blankets and turquoise and rude silver ornaments hammered out of Spanish money into necklace and bracelet.

Walls Antedate Coronado

There are signs of walls which antedate the coming of Coronado in 1540 by hundreds of years.

Taos is Taos property. Title was given by Spain four centuries ago, and the little, red adobe, terraced houses, with their smell of juniper wood in the fireplaces of each room, are the Taos dwellings.

Unlike most pueblos, which are built on the crests of the mesas, Taos lies in the lap of a valley, a two-castellated, five-story adobe structure, one on each side of the mountain stream. Some 700 persons live in these two huge houses, not less than three rooms to a family. The men wear store clothes; there are a few modern wagons; otherwise, it is the time of Coronado.

You enter the houses by ladders that ascend to the roofs and are drawn up to bolt the doors, so to speak. Women draped in white blankets ascending these ladders give an Oriental tinge to the air, and it is easy to think this is elsewhere than here in America.

Down by the stream you will probably come across women washing blankets by beating them in the running water, and you will notice the red and blue and white shawls over their heads and the white puttees on their feet.

Taos is the nearest approach to a socialistic community America has ever known. Houses are built and occupied communally, and ground is common property, but the product of each man's and woman's labor is not in common, but his or her own.

Who first saw Taos, the most ancient city? Who knows? Some say Cabeza de Vaca and his companions, shipwrecked on the coast of Florida, wandered westward from Taos to Laguna and Acoma. Made slaves by the Indians, the story goes, and traded from tribe to tribe, they finally reached Old Mexico to tell luring tales of gold and of precious stones.

Coronado's expedition followed in 1540, but before that the Franciscan Fray Marcos and a party had been there.

The trip Coronado made on the strength of the reports of these former men has been told and retold in dozens of tongues. The adventurers found Zuni and the Three Mesas and Taos, small, terraced clay houses, built child-fashion as if with blocks, and no treasure of any sort.

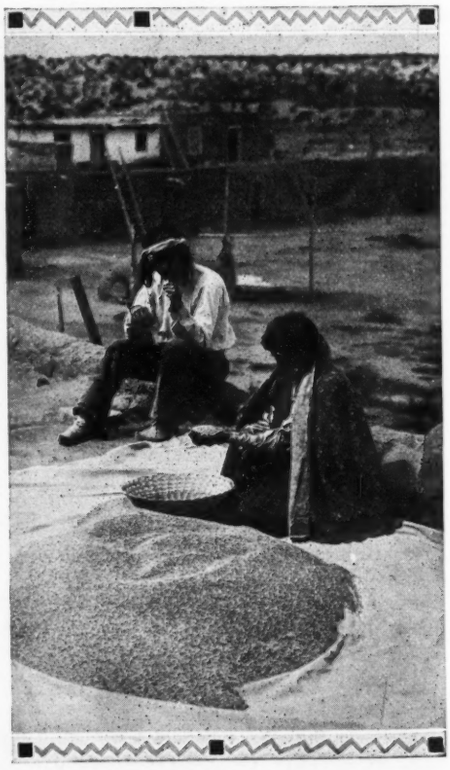
A contest for possession between white adventurers and Pueblos followed this disappointing expedition of Coronado. The last great uprising came soon after American occupation. Kit Carson, for whom a reward of 1 cent was offered by the saddler whose trade he had fled, was living at Taos then.

The Pueblos had seen the passing of the Spanish and the expulsion of the Mexicans; why not expel the Americans? Mexicans were behind the uprising, which failed and with its failure made end to attempts to overthrow alien domination.

Taos Rebells Always

True, Taos was never at war with the United States, as neither were other Pueblos. But this was close to war and is blamed on plotting New Mexicans, who asked Taos co-operation.

And, though Taos could not overthrow



The Pueblo woman is domestic, but she often works outdoors

As old as the cliff dwellings of their ancestors is the Pueblo skill of masonry. This man's wife will probably plaster her own home

white rule, for four centuries it has resisted white influence as stoutly as in the days when the knotted cord called the tribes to gather for armed resistance.

If you visit Taos in late September, the feast of San Geronimo will be bringing forth stalwart, thick-set, muscular figures, hair banded by red scarfs, trousers of loose, white material, tunic of gray or white blanket, wrapped Arab fashion from shoulder to waist. There will be dancing all night and all day, rude theatricals and horse and foot races.

Persia is not more romantic. But it is not Persia or Palestine or Spain, but America out at Taos.

The scene recalls market day in Old Mexico. Wagons of grapes, apples, peaches, melons, pottery and blankets edge the plaza. Booths of lemonade, sweets and trinket-venders catch the eye. The Taos women are gay with bright garments and silver necklaces. Mexicans attend, and other pueblos have delegates.

The fiesta starts with a dance of Indian men, bearing branches of quivering aspen, facing each other in two lines and yelping like desert coyotes. Then comes a race and the antics of the clowns, chiffonetti, or delight-makers.

The play of the clowns continues for hours. They steal fruit from the wagons; the crowd laughs. They mock the dancers; no one thinks them irreverent. They fool the crowd again and again; they are great entertainers. As a climax, they climb a greased pole for prizes of melons, cakes, or a sheep at the top, and the fiesta thus ends.

The main interest in San Geronimo day will be found to lie in the crowd, which is the largest of those at all fiestas. More elaborate dances can be seen elsewhere, but the gatherings are never so varied as here.

Nine miles from Santa Fe, on the road which leads to Taos, rests Tesuque—Tesuque, whom constant contact with traders and tourists has sadly commercialized.

Tesuque's annual public fiesta comes November 12 and this is one of Santa Fe's gala days also. The dancers in their barbaric costumes and prismatic colors, and the crowd of spectators, most of whom are in more or less holiday attire, are foreign to conceptions of the United States.

Orient Color in Dress

The Tesuque Pueblos look different from other Pueblos, though the same Oriental effect exists. The men wear loose cotton trousers outside shirts, usually short, wide and flapping. The women wear dresses of dark woolen material, neatly belted at the waist. The skirt reaches only to the knees, and the legs are swathed in buckskin as appendages to moccasins. Color exists in a cape of light material. The hair is banged and cut short at the sides, but tied with red yarn in a club behind.

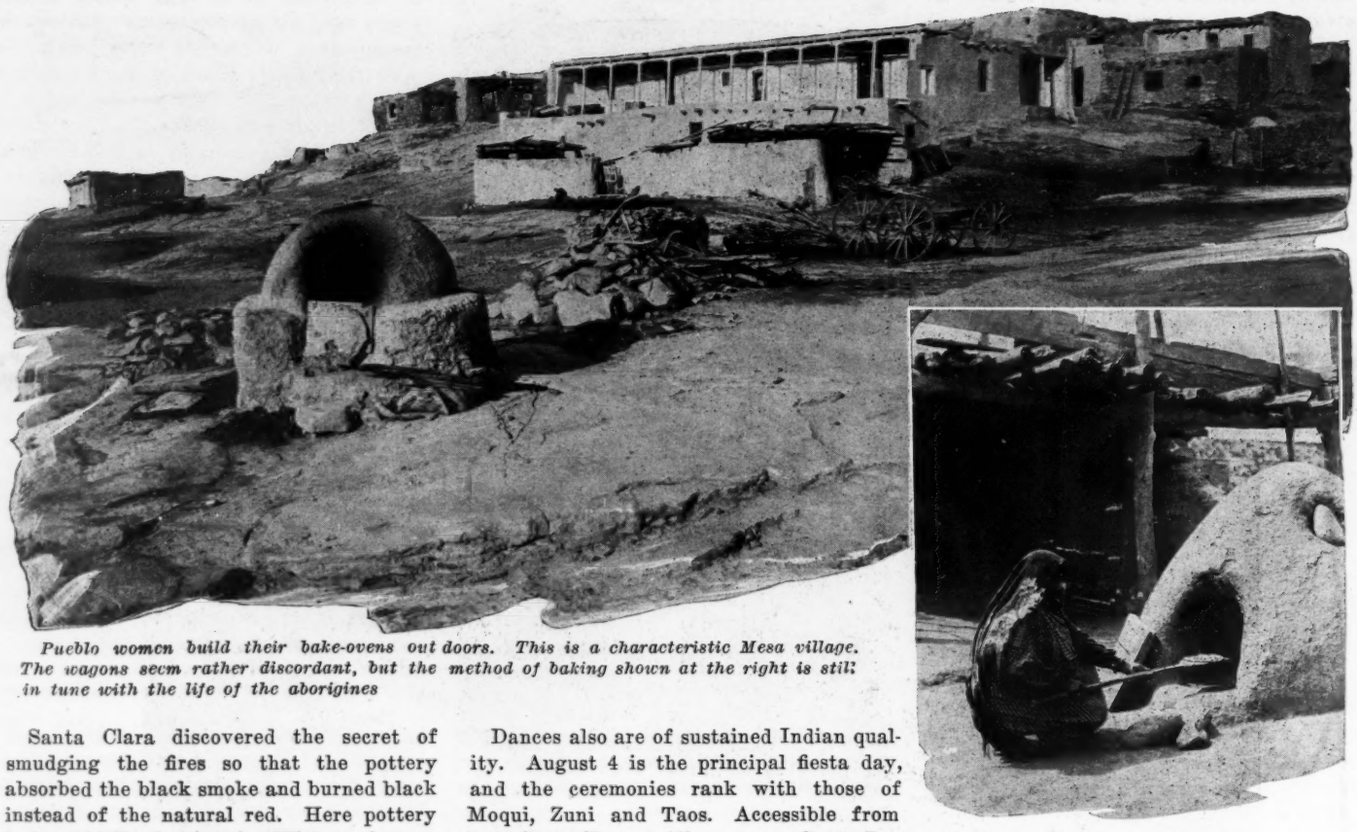
Just 6 miles from Tesuque is Nambe, which, with Sandia, once had an evil reputation as to witches. Nambe is now Mexicanized, but the Pueblo spirit lives ever, and on their annual fiesta days the half-dozen dancers dance just as blithefully as those in the days of many hundred dancers.

The chances are you cannot visit Nambe long, for its people may quit as Pojuaque, its neighbor, quit several years ago, when only ten persons remained to observe the ancient traditions. Pojuaque is no more as a peublo, though it still is a good stopping-place for travelers.

A few miles from Pojuaque, over a lonesome, sunburned plain, untillable even by the irrigationist, you come again to the Rio Grande and to San Ildefonso. Towering above is the Mesa Huerfana, called by the Mexicans "The Orphan." Here San Ildefonso sought refuge when de Vargas appeared on the banks of the Rio Grande. The siege lasted 9 months before the people of San Ildefonso surrendered and came down as Spanish subjects.

From San Ildefonso the way leads by the Mexican village of Espanola to Santa Clara and San Juan—Santa Clara, overlooking the Rio Grande and the jagged peaks of the Sangre De Cristo beyond and famous for shining black pottery; San Juan, which gave the Pueblos their most famous leader, Popé.

The people of Santa Clara are taller and more slender than the short, stocky Pueblos of the south. They part their hair in the middle and braid it on the sides. Explanations cite a union with nomadic neighbors, the Utes, the Apaches and the Navajos.



Pueblo women build their bake-ovens out doors. This is a characteristic Mesa village. The wagons seem rather discordant, but the method of baking shown at the right is still in tune with the life of the aborigines

Santa Clara discovered the secret of smudging the fires so that the pottery absorbed the black smoke and burned black instead of the natural red. Here pottery is beautifully fashioned. Without decoration, its beauty depends entirely on form, of which its makers are masters.

San Juan tells of the wonderful Popé, the organizer of the one successful revolt against Spanish rule, in 1680, which drove the Spaniards out from the Pueblo country and kept them out 12 years.

A well-traveled public highway runs through the pueblo lands here, and San Juan is very busy. Old men sit in the sun at their doorways, mending tattered moccasins; women prepare the streetovens for the wheatbread baking; girls with jars of water on their heads pass to and from the well; farm wagons of corn and wood come in from the country, and children play everywhere.

Conservative Santo Domingo

Returning to Santa Fe and the main highway, the motorist passes Domingo on his way westward, or he can go there directly from Espanola. A short 3 miles off the road is the most conservative and the largest of pueblos, Santo Domingo.

Santo Domingo is deeply conservative, so conservative in fact that the superstition as to the evil eye of the camera makes it inhospitable at times.

Here resistance to white education has led to the abandonment of the day-school. Santo Domingo's children go to the Government boarding-school at Santa Fe, for the arm of the Government avails in spite of resistance.

Old fashions cling, and dress, which is rapidly changing in other pueblos, differs little from that of the ancients. The women still wear the quaint manta, or garment of one piece, which leaves a shoulder bare and hangs to the knees.

Dances also are of sustained Indian quality. August 4 is the principal fiesta day, and the ceremonies rank with those of Moqui, Zuni and Taos. Accessible from both Santa Fe and Albuquerque, Santo Domingo offers a better opportunity to the motorist than any other large pueblo, and is the most aboriginal.

Cochiti lies 10 miles up the river from Santo Domingo, but Cochiti has let both Americans and Mexicans engulf its traditions. The girls and women are likely to be seen dressed in the shirtwaists of white civilization and carrying water in store buckets and lard pails, by hand, American-fashion. They will even let their pictures be taken without parley, an exception to most pueblos.

Not far from Albuquerque is Isleta, rather prosaic, beside Taos, for instance. Isleta is called a white man edition of the Hopi type. It differs from the conventional pueblo with its lateral structure over wide spaces. Great trees grow in and around it, and the houses are not, as a rule, terraced.

Isleta houses have American furniture, but they retain an Indian flavor by Navajo blankets spread everywhere. The people are proud and independent, and well they may be with their flocks, vineyards and working in silver. They know all about mowing machines and baling alfalfa, and are willing to work night and day when the crops call.

But the Isleta is like other Pueblos, after all. He works hard, and he plays hard. When his corn is in the house and his melons on the roof, or hanging safely from the rafters just inside; when his chili peppers sun in all their color overhead and fat sacks of wheat are stored away, all this seems worthy of song to him; so he sits in his doorway and sings.

Many of the pueblos are dying. Some are already dead, but the glories of Acoma and the Enchanted Mesa live to make Pueblo lore real to the outsider.

Of all the pueblos of New Mexico, Acoma is by far the most wonderful. Built on the summit of a mesa whose sides are 350 feet high and reached by paths of great dizziness, this prehistoric pueblo stands unchallenged.

To reach Acoma, one motors first to Laguna, 58 miles from Albuquerque. Laguna, too, is a pueblo, the child of Acoma, larger but less famous, for the glories of Laguna are over.

Refugees from Acoma, Zuni, and Cochiti founded Laguna in 1699 and were knit together as they joined to repulse the attacks of the Navajo and the Apache.

Floods Laid Waste to Laguna

Tier upon tier of streets and three-story houses, up and up to the great Spanish church at the highest—this is Laguna. Long ago, in the fifties, the dam to the lagoon broke and laid waste to the land with flood waters. Now, only the women stay in the village; the men must leave home to get work.

But motor on to Acoma, the Wonderful, 15 miles to the south, with the famed Rock of the Southwest—the Enchanted Mesa—lifted high in a turquoise sky.

Here quaint terraced houses, a huge church—equal to Egypt's pyramids in patience of labor—the great reservoir in the rock, the wonderful scenery and romances and the life of 600 persons, all await the visitor.

No one knows when Acoma was founded. Tradition gives no hint. Legend has it that the pueblo once perched on top of the Enchanted Mesa, which rises 700 feet

nearby. About 400 years ago a storm destroyed the only pathway while the villagers were in the fields, and three sick women perished out of reach.

Acoma, the new city, was built and had grown old when Coronado saw it in 1540. There are six houses, three-stories each. The church towers above all. Some say it took 40 years of backbreaking portage from the plains to build it.

On this mesa, the people of Acoma received Coronado and his soldiers, to whom they at first attributed celestial origin. How the Spaniards revealed their real nature and what the Pueblos did to correct their mistake is another story. In the end, Zaldevar and sixty men took Acoma, and Diego de Vargas resubjected it after the uprising of 1680.

Acoma's Hostility of Old

Here, too, the first missionary was received by arrows in 1629. But Brother Juan Ramirez, the apostle to the Acomas, seemed a different white man. A little girl accidently fell to the cliff, fell, unseen by the Indians above, to safety on a ledge. The Brother picked her up unhurt and bore her smiling to the Indians, who welcomed him as a great medicine-man, because they thought the child was dashed to pieces on the rocks below.

Fiesta time in Acoma is an Old World gathering. For days in advance, people come to the pueblo to stay for the event.

On the day of the fiesta, the hollow voice of the drum calls the sleepers from their beds on the roofs, where they have slept Syrian-fashion beneath the stars the night before.

The rich progressives of Acoma appear in broad-brimmed sombreros set squarely on their heads, giving them a Quaker appearance. They wear boiled shirts, black trousers, open black vests without coats and stiff brogans. The red bandana alone is retained from the native dress.

Girls with jars of water on their heads come and go

The rich conservatives, on the other hand, are gay in blankets of striking design, with red garters and tassels. The women wear the short Pueblo skirts with gorgeous leg moccasins, silver necklaces and silver bracelets.

Such scenes as are found here verify the saying that Acoma is "the Garden of the Gods multiplied by ten plus a human interest." The Acoma resident suns himself on the brink of a rock where, 3 centuries ago, his ancestors spat defiance at the Spaniard. Girls with water jars poised upon their heads climb to the upper terraces and disappear into various houses.

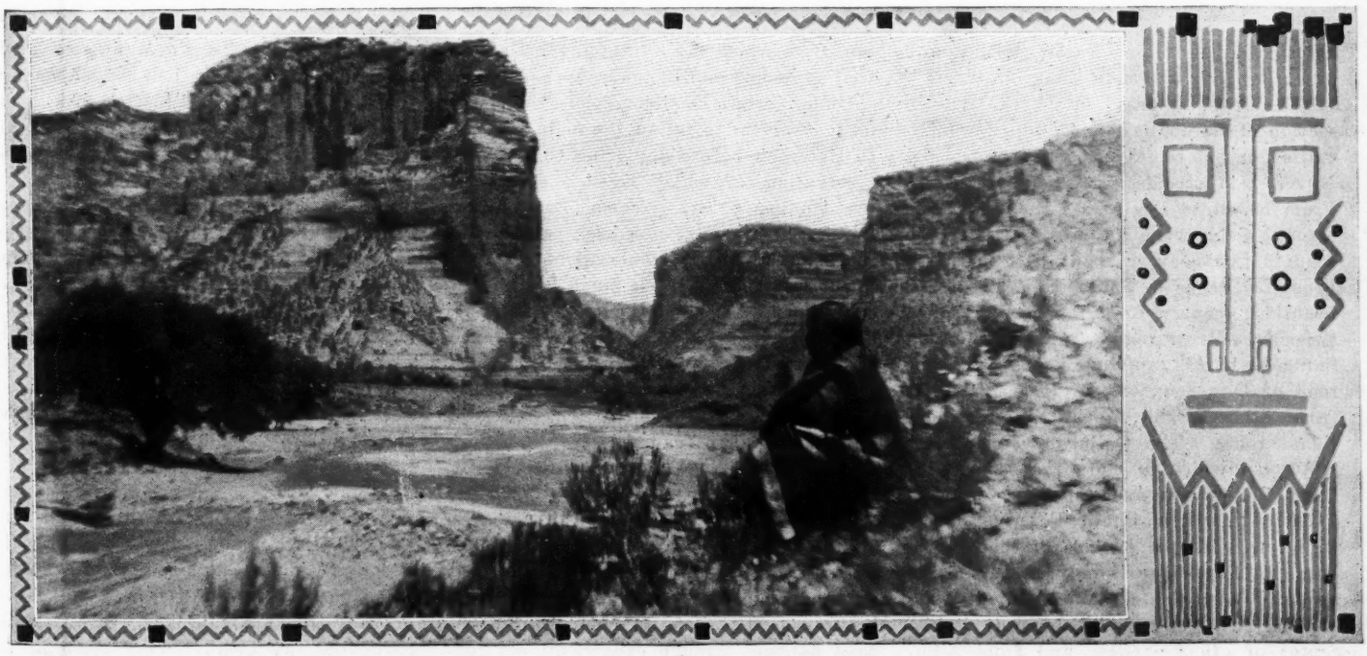
Acomas are not Indians, but descendants of the Aztecs, who came from the south, the Acomas claim. At any rate, they are workers. With the rising sun, Acoma men, on foot or horseback, start on their leisurely way to the cornfields in the plain. They sing, too, as they go and as they work, quaint, aboriginal melodies, pitched high, resembling Swiss yodels in their repetition of one strain over and over.

From Acoma there is a road to Gallup, and from Gallup stretches the ways to Zuni and Hopi pueblos. Other roads to the Hopi can be taken from Holbrook, Winslow, or Flagstaff, Ariz.

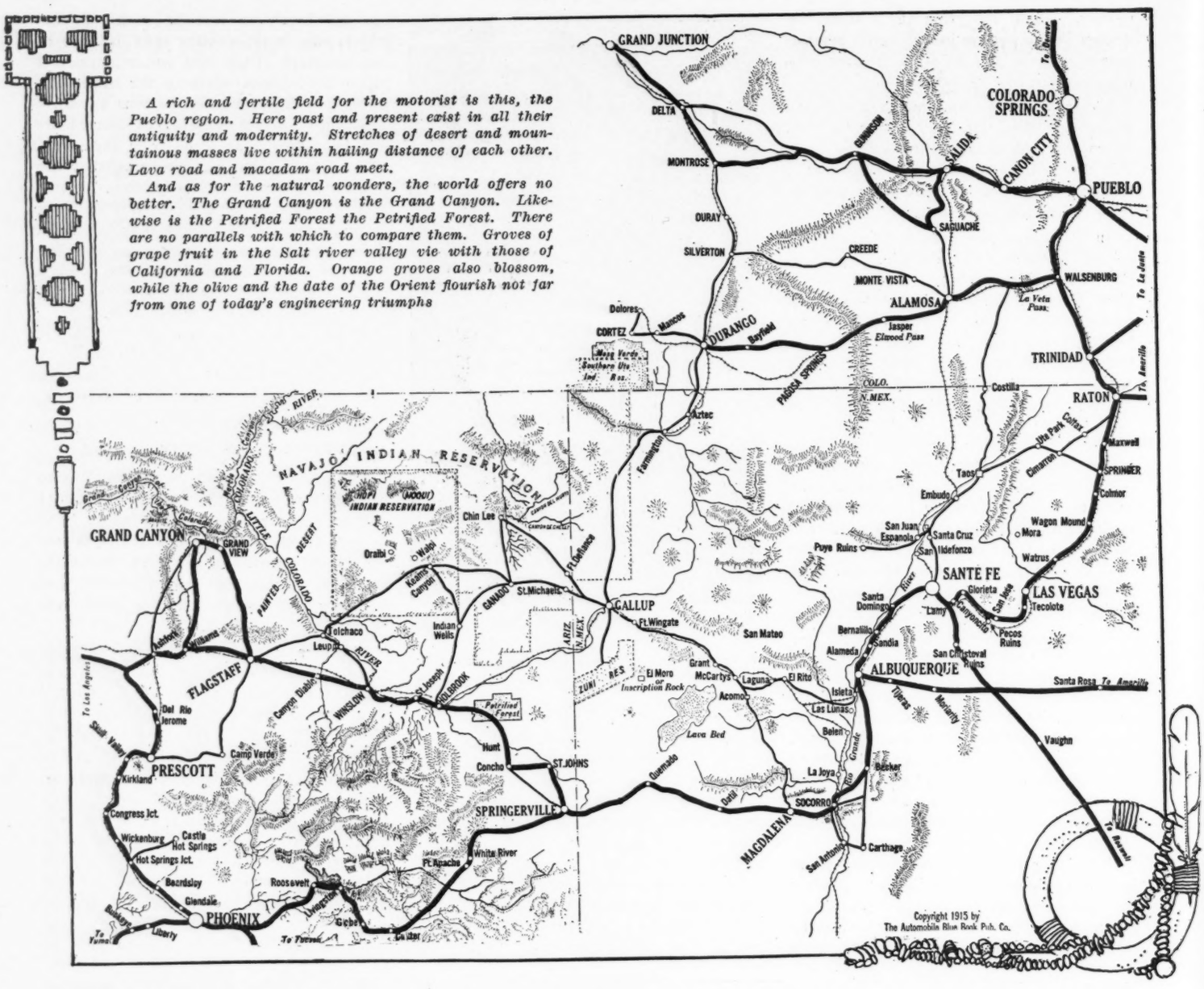
Roads in the Pueblo Region

The main highways across New Mexico and Arizona are on a high plateau, and the grades are exceptionally easy. The main road, the National Old Trails, is seasonable 12 months in the year. Motorists averse to intense heat should avoid it during July and August, but it is ideal from September 1 to July 1.

The greater part of a journey in these two states will be over flat, rolling country. Most of the roads can be called "good." The natural roads are surprisingly fine. Though 559 of the 1,947 miles of the National Old Trails from Kansas City to Los Angeles is through mountainous sections, this does not mean travel over heavy grades, as the mountain road is across a flat plateau or follows a valley in many instances. Nor need the reports of 474 miles of arid stretches worry you if you are a prospective visitor to that region. Most motor troubles in crossing these stretches are said to be due to lack of



America has her Sahara, and the Navajo is her Bedouin, who leaves the mesas to the pueblos that he may roam the desert



foresight in providing water, gasoline and oil rather than to heavy sand.

The main highway enters the Pueblo section at Raton Pass and offers few difficulties, except to extremely low-hung cars. Never is there danger from precipices. From Raton to Las Vegas the way leads through fields 20 miles wide. Part of the road is fair country road; part is rocky. From La Vegas to Santa Fe, 73 miles of beautiful scenery form the setting for a twisting, narrow road. The stretch from Santa Fe to Alburquerque is a magnificent road of lava foundation. It is 161 miles from Alberquergue to Gallup on an optional route. The Gallup route ends at Holbrook, which is more than 300 miles from Albuquerque over the main highway.

A few days in Santa Fe give opportunity to visit the pueblos of that neighborhood. Each one is only a short drive away. Taos, the most distant, can be reached in 5 hours. Albuquerque is the center of other pueblos, and from Albuquerque there is the optional route to Gallup, from which the Zuni and the Hopi, as well as Acoma and Laguna, can be reached.

Under certain local conditions the motorist may prefer to follow the main highway to Holbrook before detouring to the Hopi reservation, of which Keam's Canyon is the trading point. Acoma, Laguna and the Zuni, however, are best reached enroute to Gallup, and the road between Albuquerque and Gallup is much better than that from Gallup on, though all is easily accessible for a light car of good clearance.

Following the Gallup Road

In regard to the nature of the Gallup road; it consists of miles and miles of easily ascending road for the first part. A former bad place, the Rio Puerco river, now has a good bridge. From Laguna to Acoma the way is southward across a stubbled prairie into desert valley lined with distant cliffs. From Acoma one drives long and tediously with no serious hindrance to Gallup. Beyond Gallup the road ascends through cedars, crosses rolling stubbled prairie again, re-enters cedars and pines and after traversing rock and sand strikes a timber belt, which ends in a stretch of sandy trail to Holbrook, where it connects with the main highway again. Keam's Canyon and the Zuni reservation are short distances from Gallup.

While a few advise camping outfits if the road to Gallup is taken, others agree that this is unnecessary on the main highway. Towns and cities exist at an average maximum distance of 50 miles. The smaller towns of 1,000 and 2,000 inhabitants have hotels equal to those of towns of 10,000. During the touring season it is best to reserve accommodations in advance. Garages are available throughout the region.

If one wishes to camp, however, nothing need prevent it. You are apt to find much quieter times among the so-called wilds of the West than at home, where the joyrider passes at all hours and wakes the hours with his noise makers. Camping conditions are ideal. Many sleep in the open without tents even.

Test Fuel in French Army

Adopt Standard European Carbureter for American War Trucks

Officers Find Much Improvement in Economy Possible

PARIS, France, Aug. 1—Dissatisfied with the gasoline consumption of many American trucks, the French army motor car authorities have decided to adopt a uniform type of French carbureter. For more than 6 months there have been complaints that gas consumption was too high. This was due, in many cases, as the American factory representatives in France were able to prove, to incorrect carbureter setting and poor driving. Nevertheless, the authorities were of the opinion that considerable economies could be effected in the amount of gas consumed by army trucks.

One French carbureter manufacturer offered to replace the whole of the carbureters on American trucks with his instrument and accept as payment half the price of gasoline saved. This offer was not accepted, but the authorities ordered careful records to be made of mileage and consumption for every truck and convoy in army service. These statistics have been compiled over a period of several months, and are the most elaborate of any got together by any truck users.

The comparative diagrams show the gas consumption for a given period of all White, Packard, Velie, Jeffery, Kelly, Reo, and Pierce-Arrow trucks. A feature of these diagrams is the wide divergence between trucks of a different make but a common load capacity. A more curious case is that for one of these makes the gas consumption of the 5-ton model is only a fraction higher than that of the 3-ton type.

When this data had been secured, the authorities held a competition among French carbureter manufacturers. Three firms took part: Claudel, Zenith, and Solex. The winner was Claudel, who was given the initial order to replace the carbureters on the Reos. Statistics showed that the 3½-ton Reo was consuming 4.52 miles to the gallon. With the Claudel and other European carbureters the figures given out are 7.36 miles per gallon. Results with the 3½-ton Sterling were practically the same, the consumption being dropped from 51-52 liters to 31 liters. The Sterling is not used very extensively in the French army, and no army records have been made of its consumption, but there are more than 100 of them employed by the munition factories around Paris.

The first attempt to economize was made by Chief Engineer Michelat, of the Delage factory who cut his consumption 40 per cent. This example was followed by other users, until about 60 of these trucks have been converted to European carbureters. It is understood that Ferdinand Charron, who holds the agency for Sterlings in France is supplying all trucks at present time with Claudel carbureters.

Complaints of high gasoline consumption having been brought to the notice of the Pierce-Arrow engineers in France, it was decided to hold a comparative test in order to show that the high consumption was not due to any fault in the truck or the carbureter. Two of the factory representatives took ordinary trucks in army service, obtained the proper carbureter adjustment and took their place in a convoy driven by soldiers and commanded by an officer.

Sixteen Valve Stutz

Stock Motor Comes as Aftermath of Racing Machines

INDIANAPOLIS, Ind., Aug. 22—The Stutz Motor Car Co. announces a new speedster model in which will be installed a sixteen-valve, four-cylinder, T-head motor. Experimental cars have been on the road since Stutz first introduced the sixteen-valve motor in racing cars, and rumors have been current for some time that the motor would eventually be marketed. The speedster model alone will have the new motor, the four and six-passenger and roadster bulldogs continuing with with the eight-valve motor as announced previously in Motor Age.

The motor has a bore and stroke of 4⅜ by 6 inches. Cylinders are cast in a single block, which is a departure from previous Stutz practice. Exhaust ports are separated, there being eight ports extended into the manifold.

Ball bearings are used in the pump and magneto-shaft bearings. The crankshaft is three-bearing. Valves are operated by roller lifts. Cooling is by centrifugal pump and lubrication is force feed through the hollow crankshaft.

Petroleum Is Plentiful

Figures on World's Production Presage Early Drop in Gas Prices

Crude Output for 1915 Exceeds That of 1914 by 28,194,307 Barrels

CHICAGO, Aug. 21—The price of gasoline has remained unchanged throughout the central West since the general reduction of one cent in this territory last week. However, it is anticipated that there will be further reductions on account of the enormous production of crude petroleum. For 1915 the production of crude broke all world's records, exceeding the output for 1914 by 28,194,307 barrels or 7 per cent.

Sections additional to those mentioned last week in which a drop of 1 cent a gallon have been reported, include Ohio, in which the Standard Oil Co. of Ohio has lowered the retail price at Cincinnati from 23 to 22 cents; Wisconsin and upper Michigan, Milwaukee, gasoline retailing at 17.6 cents per gallon, a 1-cent reduction; Illinois and Indiana a 1-cent reduction with a retail price of 19.5 in Chicago. Oil men in Cincinnati believe that the price will fall to 16 cents before February.

The price of gasoline in Detroit, Mich., has been dropped 1 cent to 18 cents per gallon by the Standard Oil Co. Competitive oil supply companies have not yet met the reduction, most of them still asking 19 cents. Local Standard men are of the opinion that another drop may come.

According to the geological survey the 1915 production of 426,892,673 barrels was widely distributed, the greatest increase being shown, however, in the United States and Mexico. Japan, Russia and Argentina also showed decided increases.

The distribution of this petroleum to the markets of the world is shown in the table at the bottom of this page.

World's Production of Crude Petroleum in 1915 and Total Yield Since 1857

Country	Quantity, 1915 Barrels of 42 gallons	Per cent of total	Quantity, 1916 Barrels of 42 gallons	Per cent of total
United States	*281,104,104	65.85	*3,616,561,244	60.10
Russia	68,548,062	16.06	1,690,781,907	28.10
Mexico	32,910,508	7.71	124,270,377	2.05
Dutch East Indies†	12,386,808	2.90	148,999,921	2.48
Roumania	12,029,913	2,82	130,012,387	2.16
India	‡7,400,000	1.73	80,789,711	1.34
Galicia	4,158,899	.98	136,032,500	2.26
Japan and Formosa	3,118,464	.73	30,169,622	.50
Peru	2,487,251	.58	16,794,223	.28
Germany	995,764	.23	13,961,333	.23
Trinidad	‡750,000	.18	2,819,430	.05
Argentina	516,120	.12	1,033,121	.02
Egypt	221,768	.05	1,308,496	.02
Canada	215,464	.05	23,709,074	.39
Italy	39.548	01	842,000	.01
Other	‡10,000		372,000	.01
Totals	426,892,673	100.00	6,017,457,366	100.00

* Marketed production. † Includes British Borneo. ‡ Estimated.

Boston Absorbing New England Trade

Car Distribution in Smaller Cities Directed by Hub Dealers

BOSTON, Mass., Aug. 21—So far as motor car distribution is concerned, Worcester, Mass., Providence, R. I., Portland, Me., and a number of well-known New England cities will soon be wiped off the motor map. Worcester has practically ceased to be as a distribution point, Boston dealers having taken over most of the agencies there and they contemplate taking over the trade in the other cities mentioned as well as practically all other New England distribution towns of any importance. Ultimately Boston may become the distributing center for all New England.

Alvin T. Fuller, the Boston Packard dealer, has already taken over Worcester and controls the Providence, R. I., Portland, Me., and Manchester, N. H., Packard distribution.

Last week the Boston Overland distributor took over the Worcester business. The Worcester Buick agency comes under the direction of the Noyes Buick Co., Boston. The Becker-Stutz Co., Boston now includes Springfield, Mass., and has gone into the Providence territory. Recently the Peerless agency in Providence was taken under Boston direction. The Boston Cadillac agency controls several points throughout New England. Studebaker controls the Worcester business through Boston and the same applies to Oldsmobile.

One of the Reasons

Where the desirability for controlling these smaller places comes in is in the moving of used cars now taken in trade so freely. If an agent has three or four places he can take some used car of a particular make, say at Portland, knowing that he can get rid of it at Providence to some one, or at Worcester, and vice versa. In other words he can keep moving his cars in a circle, and so get the greater margin of profit. It means some financiering, but as Mr. Fuller has made it a success others are now being inoculated with the idea since they have realized how great is the demand for their lines in the outside territories.

MINNEAPOLIS SHOW FEBRUARY 3-10

Minneapolis, Minn., Aug. 21—The winter show will be held February 3 to 10 inclusive and as formerly will be under the auspices of the Minneapolis Automobile Trade Association. It will be held in the armory.

JEFFERY NOW NASH MOTORS

Kenosha, Wis., Aug. 21 — The name, Thomas B. Jeffery Co., has ceased to be as a manufacturing organization, and henceforth the company making Jeffery cars and trucks will be known as the Nash Motors Co. This change in company name has followed the application for a license to do business in Wisconsin under the name of the Nash Motors Co., of Maryland. The name Jeffery is one of the oldest in the motor car industry and was one of the earliest names in the bicycle industry. The authorized capital of the Nash Motors Co. is $5,000,000.

HANDLES LEXINGTON IN 3 STATES

Philadelphia, Pa., Aug. 19—C. J. Rogers, of the Rogers-Sargent Motor Co., is eastern representative in charge of sales in Pennsylvania, Delaware, New Jersey and Maryland for the Lexington cars.

NEW DENMO TRUCK PLANNED

Cleveland, O., Aug. 21—The Denneen Motor Co., which has been marketing a 1¼-ton truck that sells at $1,385, contemplates bringing out another model of 1,000 pounds capacity, to sell at $750 or $800.

FALLS ADDING TESTING SHOP

Sheyboygan Falls, Wis., Aug. 21—The Falls Motors Corp., formerly the Falls Machine Co., will add two new buildings, a motor assembly shop, 119 by 119 feet, and a motor repair shop, 85 by 72 feet. A motor testing shop, 250 feet long, and having accommodations for 120 motors at a time, has just been completed.

NEW IOWA TIRE CO.

Davenport, Ia., Aug. 17—The Iowa Rubber Tire Co., capitalized at $1,000,000, was formed recently, with a number of local men as incorporators. Chief among those interested are J. W. Bettendorf, J. R. Lane and Judge J. W. Bollinger. A plant will be erected, either in Davenport or in Bettendorf, the suburb of this city, in the near future.

CAL.-HAWAII OLDS REPRESENTATIVE

Portland, Ore., Aug. 19—W. W. Stillson, who for the last year has acted as northwest manager for the Oldsmobile Co., of California, has been appointed general manager of Oldsmobile interests on the Pacific Coast north of Bakersfield, Cal., and including the Hawaiian Islands.

M. A. D. ADMITS TRUCK MAKERS

Milwaukee, Wis., Aug. 19—Forty Milwaukee motor car and truck agencies have been granted space for the state fair motor show to be conducted under the auspices of the Milwaukee Automobile Dealers, Inc., in Machinery Hall, at State Fair Park, during the week of September 11.

At this time the by-laws were amended to the effect that local manufacturers of either passenger cars or trucks, who have retail sales departments, may become members of the M. A. D. As a consequence, the Stegeman Motor Car Co. and Sterling Motor Truck Co., both of Milwaukee, have been elected to membership. Four new retail agencies also were admitted to membership, the Saxon-Reynolds Co., Saxon; Stephens-Adams Motor Sales Co., Case; Olson & Pauly Automobile Co., Ross eight, and Rademacher & Jaeger, Paterson.

MELBOURNE HAS CHARGING STATION

Melbourne, Australia, Aug. 1—Electric vehicles will find new encouragement in Melbourne hereafter. The municipal electric supply department has opened a charging station for electric vehicles, which will give service night and day. A charge of $2.43 a vehicle a week will be made for accommodation; the cost of current will be 2 cents a unit.

NEW KING DEALER IN K. C.

Kansas City, Mo., Aug. 19—The King Motor Sales Corp. has been organized and will take over the agency for King eight cars, formerly handled by the Donnelly-Campbell Motor Co. The new company will move from 1706-8 McGee to 1901-3 McGee, where a building is being remodeled for the purpose. This transfer will be about September 1.

PRESS ON TIRES WHILE YOU WAIT

Kansas City, Mo., Aug. 19—Drivers of solid-tire commercial vehicles in Kansas City can now get their tires pressed on or off while they wait since the Kansas City branch of the United States Tire Co. installed a shop for that purpose. The company has added a complete shop with a press capable of a 300-ton pressure and the item is being well received.

TRUCKS IN PREPAREDNESS FEATURE

Cincinnati, Ohio, Aug. 18—In the event of a railroad strike, Cincinnati is planning to eliminate the hardships by the use of motor trucks for the transportation of food supplies. Dr. R. B. Blume, chief food inspector, has been working among farmers and truckers in an effort to secure their co-operation in the movement. A large number of farmers have pledged themselves to buy or rent automobile trucks to deliver their products to the warehouses in the Queen City. In some instances several farmers from one community will either buy or rent a truck for their joint use. The plan was indorsed by the Milk Exchange, which said that distributers of milk in Cincinnati would send trucks among the farmers to collect milk.

CASE PUBLISHES SAFETY PAPER

Racine, Wis., Aug. 21—Regard for the safety of its 5,000 employees has caused one Racine concern, the J. I. Case T. M. Co., to publish a shop paper dealing with

safety methods. The paper is a monthly and is distributed free to all members of the big Case family. Besides safety methods, better shop practices and topics bearing on the general welfare of the workers are considered.

BIG WAR TRUCK ORDER

New York, Aug. 18—One of the allied governments has placed through Gaston, Williams & Wigmore, an order for 2,400 Peerless trucks, delivery to commence immediately. Delivery will be made at the rate of from eighty to 100 trucks a week until late in 1917.

K. C. SOCIABILITY RUN

Kansas City, Mo., Aug. 19—The Kansas City Motor Car Dealers' Association is planning its annual sociability run, which is in fact a trade extension tour. It will be routed in northeastern Kansas, probably will be held early in October.

WOULD BUY PA. TOLL ROAD

Philadelphia, Pa., Aug. 19—The Pennsylvania state highway department has offered $98,000 for the Philadelphia-Paoli toll road, owned by the Lancaster Improvement Co. In case the offer is not accepted the toll road will be taken over through condemnation proceedings.

BLUE BOOK TO MAYORALTY

St. Louis, Mo., Aug. 19—The good road work of Edward M. Flesh, president of the Automobile Club of St. Louis, has put him much to the front that his friends have started a boom for him as the next Republican candidate for mayor.

FORD SUED BY VITAGRAPH

New York, Aug. 21—The Vitagraph Co. of America has begun suit against Henry Ford for $1,000,000 damages. The action follows Mr. Ford's publicity campaign attacking the motives of the Vitagraph in producing the Battle Cry of Peace.

STUDEBAKER TO BUILD

Detroit, Mich., Aug. 19—The Studebaker Corporation has awarded contracts for construction work that will add 40,000 square feet to the floor space of the Studebaker factories. An extra floor, 50 by 300 feet, is to be added to one of the three-story buildings at present used as a warehouse for materials, so that the Studebaker plants may be better prepared to stock up on materials in advance of immediate needs. A new one-story building to be used in connection with final assembly work is to be erected on the site purchased by the Studebaker company in May, adjoining plant No. 3 on the west side of Detroit. With the annexing of this property the total floor space occupied by the Studebaker factories has been increased to 150 acres.

Progress in Ford Distribution

Thirty Agents for Chicago—St. Louis, Kansas City and Minneapolis Perfecting Plans

CHICAGO, Aug. 21—A general re-arrangement of Ford distribution facilities has gone forward throughout the country during the past week. In line with the new Ford sales plan outlined in last week's issue of Motor Age, there have been many changes in Ford car sales throughout the country. In almost all sections former sales employees and former Ford dealers have become Ford agents under the new plan.

City agencies may sell anywhere in the city and maximum and minimum limit will be arranged, depending on the locality. The minimum for Minneapolis for instance is twelve cars, the minimum in Chicago is ten, and the maximum 500.

The plan is really very simple in its workings, and requires only that the prospective dealer have financial responsibility and a garage at which he can take care of service for the car. The dealer can interpret the word "service" in any way he sees fit. Possibly Ford will continue to give service for some months yet at the various branches and assembly plants throughout the country but when a man comes for service he will be told that time is the last from the Ford company direct.

The reason for limiting of the number is obviously to prevent any strong dealers from monopolizing the retail selling to the detriment of the less strong ones. There is a regular discount per car, and if the dealer meets the estimated number of cars he has arranged for per month he will get a bonus on each car at the end of the fiscal year. If, for instance, a dealer contracts for twenty-five cars a month for the year, and takes this number his discount per car is increased by a bonus payment.

The number of agencies in any city or locality will be based upon the population and experience in that locality. In Detroit the maximum number is to be twenty-five agencies and this will vary for other points. Already some eighteen dealers are either selling or getting ready to take contracts. The contract limits the dealers to selling cars in Detroit, Highland Park and Grosse Pointe, which are really all a part of greater Detroit. Thus, in any locality, the dealers will have to confine themselves to certain selling fields, as per their contracts. Dealers must do their own advertising.

In St. Louis, last week was made a gala period for Ford men. The arrival of the new models and the opening of a number of local agencies created a general interest. Ten agencies are to be established at St. Louis and most of them have been organized and have opened salesrooms.

In Kansas City, G. T. O'Maley, former manager of the retail department of the Ford Motor Co., has secured as his own business, the retail handling of Fords. Suburban retail sales and service will be handled by a former Ford salesman.

Twelve agencies are lined up in Minneapolis for Ford cars to replace the branch selling agents, and nine of these are closed.

Aside from the increase in the number of sub-dealers from twenty-two to thirty-eight in four counties of Connecticut, the new Ford selling plan has had little effect. The Elmer Automobile Co. controls the territory with headquarters at Hartford and branches in every major city, and this concern will care for the territory under the new scheme. It expects to dispose of 2,800 Ford cars during the next 12 months as against the 1,780 sold during the past season. Those sub-dealers operating under the Elmer company who formerly controlled two or more towns in their part of the state will now devote attention to only one town.

In Columbus, O., every agency will be controlled by former Ford salesmen except for one agent who formerly handled the county. There will be eight Ford agencies in the city. In the Wisconsin and upper Michigan territory served by Milwaukee the retail business will be handled through 254 dealers. A great many of this number have been handling Ford cars, but numerous new connections have been made, especially in Milwaukee county, which has been handled direct from the branch plant. The thirty salesmen employed by the branch have become associated with new Ford retailers in the territory.

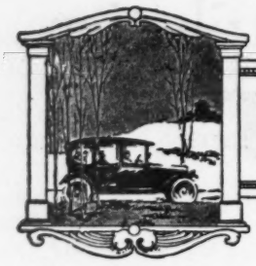
Chicago Arrangements

There will be approximately thirty retail agents in the Chicago territory. Erwin Greer, a former Ford sub-dealer, was one of the first to take advantage of the new plan of selling, and has taken charge of the Ford salesroom on Michigan avenue, Chicago's motor row, in addition to his former establishment on Wabash avenue.

Eight dealers will handle Fords in Washington, D. C., and their territory will be limited to the District of Columbia. Ford salesmen are being given preference in the new plan.

So far, there have been established nine Ford agencies covering all parts of Pittsburgh, Allegheny, and Wilkensburg, Pa. Officials expect within another week to have at least three or more agencies placed here.

Ten of the fourteen salesmen employed by the Philadelphia branch of the Ford Motor Co., have left the company with the intention of starting agencies in and around the city.



EDITORIAL PERSPECTIVES

What Is Wrong With Racing

WHY are our speedways, with startling few exceptions, losing money on nearly every race meet they hold? Why is the attendance at meets not so great as expected? Why is it that speeds of 100 miles per hour apparently do not fascinate?

SPEEDWAY racing is in such condition that a conference of doctors is necessary. Racing is not in any death agonies, but there have been so many fiascoes and semi-fiascoes this season as to warrant, as they would say in the medical profession, a consultation of specialists. Something must be done to bring racing out of the semi-coma into which it has fallen.

FIRST attendance has not been up to the mark; that is largely due to the publicity methods followed. The newspaper stories have not been such as to engender confidence. One story told that such and such drivers were coming, the next day there was doubt and as elimination day came round the public generally got wise that all of the speedy ones were not in good shape and that the field of starters would be reduced.

THAT situation is enough to hurt the attendance. Take a parallel: if the Barnum & Bailey circus followed such tactics where would it get off? How many thousands would stay away if the daily papers published stories highly conflicting, if on one day the leading clown was sure to be out and the next day he might be in, or if the best acrobatics were only able to perform one-half the time or perhaps not that. Take another parallel: if your baseball team is playing poor ball; if there is only one man on the team hitting well, then, is it surprising that the crowds do no go?

ATTENDANCE generally has been poor because so many of the public have lost confidence. They have grown tired of having entry lists of thirty names advertised for weeks and then see fifteen cars start, and of the fifteen perhaps half little better than cripples. The best circus in the world would go broke on such a performance program in less than one season.

THIS is all unfortunate and we must not hang all of the blame on the speedways but a share falls on their shoulders and a share also falls on the shoulders of the drivers. Generally our speedways have been deplorably managed. Indianapolis and Providence have been two exceptions.

ESSENTIALS OF SPEEDWAY SUCCESS

GIVEN a speedway you must have three essentials for success. They are:

1—You must have a good business management. It makes no matter how popular racing may be, you cannot run a speedway without as good business management as that of any business. A circus must have a high-class business management. Our baseball clubs must be well managed. So must our college sports. A golf club must be well managed. An athletic club must be well managed. You cannot get along in any line of business without good management.

2—You must have a good showman. Too few of our speedways have had real showmen managing them. Carl G. Fisher possesses such qualifications in addition to sound business judgment and herein lies much of the success of Indianapolis. A good showman knows how to select a good date, and that is what few of our speedways do. A good showman will not attempt to stage grand opera on July 4, on Decoration day, or on Labor day. A good showman will not attempt to put a circus on in two or three of our largest cities on national holidays. They are students in city life. They know what days are good for Chicago crowds, what days are good for New York and Boston, and when you can draw the biggest crowds in Minneapolis, Denver or Kansas City. Herein many of our speedways have erred. They have selected poor dates. Often they have done so in spite of the good suggestions of their friends. Having done such, they then wonder why people are not interested in racing, and if all interest in fast expert driving has ceased. No, the public is still interested in speed, the public still wants to see its favorite motor car drivers win in startling finishes, but it does not want to roast on a hot afternoon for 4 or 5 hours and then not see any real competition. These are prime factors to be considered if speed events are to be successful.

Better Bodies Needed

WE need a little more exclusiveness in color and finish on several of our cars that cost well over the $1,000 mark and it is questionable if it is not desirable to have a few extras on many cars selling above the $750 mark. We are creatures of likes and dislikes. When we have our measure taken for a suit of clothes we want the tailor to add one or two exclusive features. After paying a good round price for the job we want a few things to our liking. The same is true of ties, gloves, collars and neck scarfs. What is true in gloves is true in motor cars. Both are in the same scale but vary in the degree. Human nature is human nature whether with white canvas shoes or touring cars.

THE old argument of production comes up every time you talk anything different from the funeral black of our motor cars. Add another color and the entire factory organization is upset. The whole manufacturing routine is topsy turvy.

IN spite of this, a few enterprising dealers have built up a fine trade by adding a few body luxuries. One dealer has specialized on selling cars with three or four different color options. He charges perhaps $70 for extra colors and many of his buyers are led to make the purchase solely because of the color inducement. There are in New York dealers who built themselves up in business by getting out a new design of coupe or town cab. They knew better than the Detroit factory what the rich New Yorkers wanted. They knew that the chassis was good enough for the best body that fastiduous Gotham could build. They knew they could sell such bodies, whereas they could not sell the production type factory body. Knowing this, they built such bodies as they knew would sell and have made a success of selling high-class cars with high-class bodies.

A LITTLE more can be done along this line. More dealers can push their car into higher circles by such business enterprise. There must be some one in your shop who is a good body painter. It may be possible that you can buy bodies from the factory minus the finish colors. If so, your task is a little easier. It will prove good merchandising to get a few of these specially attractive bodies in your territory. It will surprise you what a little color will do. Many people will pay the extra for it and will then become good advertisers of you and your cars. If dealers have found it advantageous to build their own bodies surely the factories can afford to take the hint.

Test Precedes Decision

Boston Judge Has Demonstration of Dimming Device Before Passing on Legality

Favorable Verdict Follows Unique Trial of Case

BOSTON, Mass., Aug. 21—That seeing is believing was further demonstrated when Judge John Perrins, Jr., handed down his decision in the case of the Warner Lenz versus the headlight law of Massachusetts after an actual test of the device in question. Police officials accompanied the judge on his trip through the Boston parkways, where he made his test; the verdict was a favorable one.

Heretofore judges have sat in court and heard policemen say lights dazzled even if they had devices on them, and the officer's word was always accepted, while the motorist was fined or had his case filed. No judge would take the trouble to investigate the claims of the motorist.

Commission Refused Approval

The highway commission of Massachusetts refused to approve any device because the devices were so made that improper focusing defeated the purpose of the inventor. When the Warner Lenz case came up for trial, the attorneys were urgent that Judge Perrins investigate rather than rely upon the policeman's word. The judge said it seemed fair, and the trial was made.

The decision which followed the demonstration, in whole, was: "The fact is that a certain space must be illuminated according to the law, and a certain light must be used for this purpose. When space 150 feet away must be made light, the illuminating source must be accordingly brilliant. But I find this light not to be dazzling."

The importance of the decision lies in the fact that a judge has really passed upon a case after a demonstration. In a former case with another device, the judge discharged the defendant, but said that it may have been possible to break the law by improper focusing of the bulbs.

GOVERNMENT STILL AFTER BIDWELL

Washington, D. C., Aug. 21—A. C. Bidwell, president of the International Automobile League, has again come under the ban of the Federal Post Office Department the second time this month.

I addition to the orders issued some time ago denying the use of the mails to the International Automobile League, Ind., the International Automobile League Tire Co., and A. C. Bidwell, all of Buffalo, N. Y., comes a supplemental order to include the Buffalo Automobile Supply Co. It seems that Bidwell used the name of the Buffalo Automobile Supply Co., to evade the effect of the government's action against him and his companies.

The name of this new company has been used, it is said, as a means of sending dunning letters to members of the league who are in arrears with their dues, some of the dues having accrued from several years' membership.

FUNDS FOR THIEF APPREHENSION

Cleveland, O., Aug. 19—Any amount up to $5,000 is offered by the Cleveland Automobile Club to assist the police department in paying the expenses of ridding the city of motor car thieves. The police department has been handicapped in its work by lack of funls. Apparently a band of thieves have been at work in the city and the cars are taken to other places for disposal. Some of them have been traced to Detroit.

UNDERTAKERS USE MOTORS

Louisville, Ky., Aug. 21—The Association of Louisville Undertakers, in changing from horse-drawn to motor vehicles, has contracted with the Kentucky Automobile Co., of this city, to furnish seventeen eight-cylinder Cadillac cars of the newest model. Of these, twelve are to be limousine cars and five special chassis for mounting hearse and wagon bodies. The amount of the order is in the neighborhood of $51,000, and is said to be the largest of its kind ever given in this section of the country.

Run Your Own Barge

Wheels of Car Belt to Countershaft and Operate Propeller

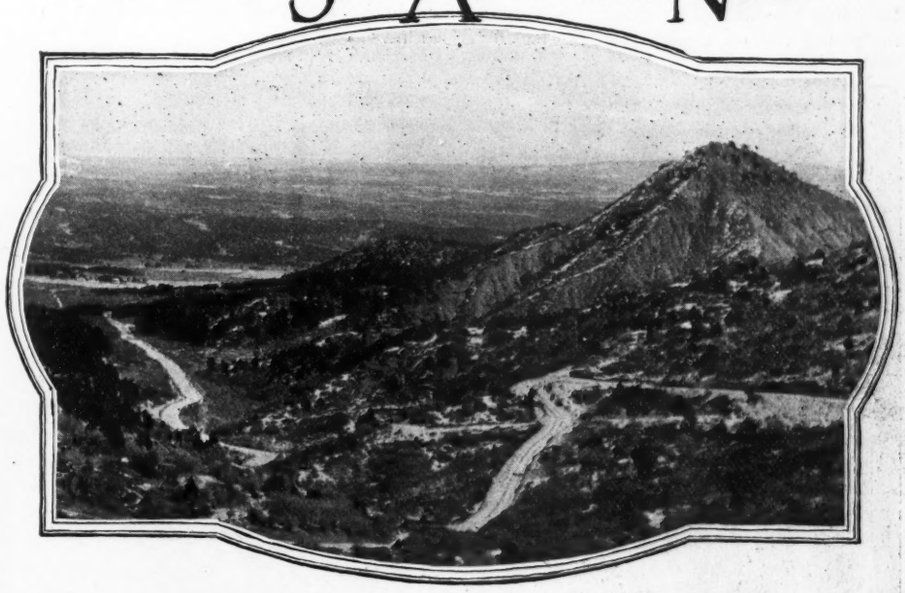
Novel Device Is the Invention of a Washington Man

ABERDEEN, Wash., Aug. 19 — If, in your motoring travels, you chance to follow the road which crosses the 16-mile wide bay between Gray's Harbor and Willapa Harbor, in the state of Washington, you will have the novel opportunity of crossing the bay on your own power. Oh, no, you cannot ford a bay; nevertheless, the ferrying system calls for a running motor.

The mechanical operation is simple. The barge is built with a pointed prow and is 24 feet long and 16 feet wide. The driving force comes from two stern propellers and two side wheels. When the car comes aboard, belts are placed around the rear wheels, and then the rear axle is raised by jacks until the belts are tight. The belts run down to wheels on shafts which turn the propellers, which make about 600 revolutions a minute to the side wheels' 200.

This invention, which is by C. W. Huctari, has opened a beach drive and made possible a cutoff of 30 miles.

See America First — See America Now



NO. 92—POINT LOOKOUT, MESA VERDE NATIONAL PARK

MESA VERDE NATIONAL PARK in Southwestern Colorado is one of the newer areas set aside by Uncle Sam as a national playground, but is none the less interesting by reason of its age as a park. The scenery is as captivating as any that will be found in Colorado or elsewhere in the Rockies.

EDITOR'S NOTE—This is the ninety-second of a series of illustrations and thumb nail sketches of the scenic and historic wonders of America to be published in Motor Age for the purpose of calling the attention of motorists to the points of interest in their own country.

King Fuel Test Shows Economy

Seven-Passenger Stock Car Averages 14.65 M.P.G. Pittsburgh-Milwaukee Run

Best Record Shown on Pennsylvania and Ohio Hills — Average Speed 19.44

MILWAUKEE, Wis., Aug. 19—A stock seven-passenger King eight traveled from Pittsburgh to Milwaukee on an average of 14.65 miles to the gallon of gasoline. The car averaged 19.44 miles per hour including all stops and carried five passengers; its total weight being 4,250 pounds. The course followed was from Pittsburgh via Youngstown, Cleveland, Toledo, South Bend and Chicago. The car left Pittsburgh August 14, 8 a. m. and arrived in Milwaukee, August 15, 3:41 p. m.

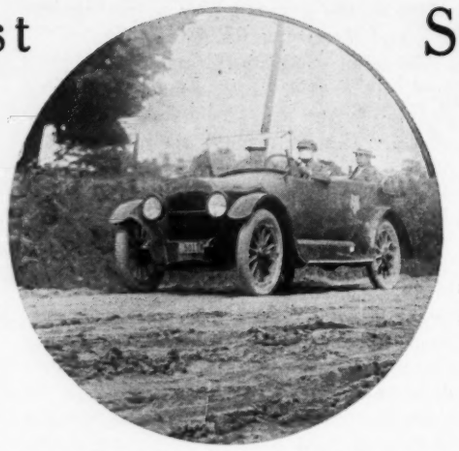
Three drivers were employed and F. E. Edwards, representing the A. A. A., officially checked the stock status of the car previous to the start and observed the consumption of gasoline on the trip.

This is the longest official economy run of a stock car over average road conditions recorded in America.

Car Strictly Stock

Before the start and at the end of the trip the King was examined as to its stock status and found in every way to be the same as is sold by any dealer. The only work done on the car on the entire trip was the tightening of a screw in the left rear hub cap.

There was seven stops between controls, one because a pilot car turned turtle, once for being blocked by a railroad train, twice for losing the pilot car, once for tightening rear hub cap, once for meeting new pilot and once for stopping the test car to take pilot in this car, a King dealer desiring to make the trip from Racine to Milwaukee in the test car.



Some good and some very bad roads were found on the run

The gasoline consumption between controls figured as follows:

	Miles per gal.
Pittsburgh-Youngstown	15.1
Youngstown-Bedford	15.5
Bedford-Fremont	13.84
Fremont-Bryan	14.74
Bryan-Goshen	14.31
Goshen-Chicago	14.62
Chicago-Milwaukee	14.87
Average for trip, 616.4 miles	14.658

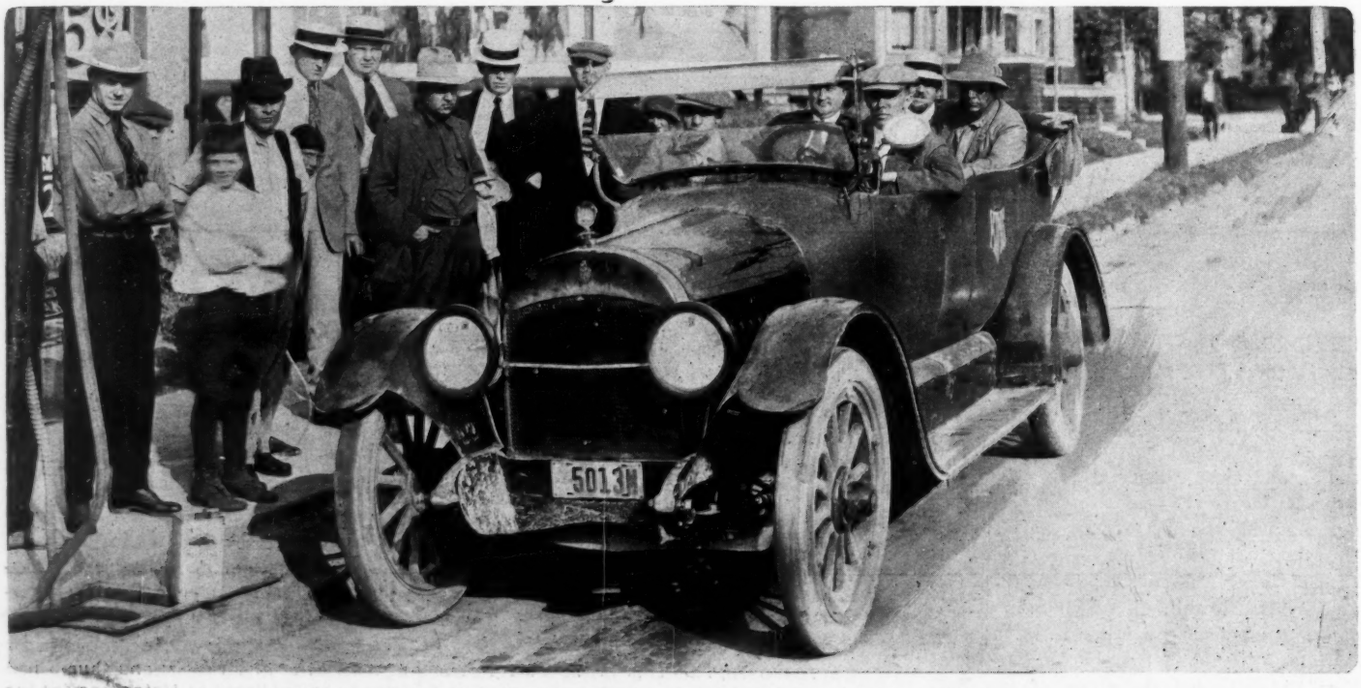
All kinds of roads were encountered from smooth boulevards to rough and sandy roads with miserable detours.

Controls to take on fuel had been selected ahead of time and the gasoline used was obtained from stations at these controls. In all cases F. E. Edwards, of the American Automobile Association, or his assistant measured the fuel with a one-gallon measure certified to by the United States Government. A graduate was carried along so that it was possible to determine to the fraction of an ounce the quantity of fuel used.

The car was a stock seven-passenger, eight-cylinder type, 3 by 5 inches, and used a Ball and Ball carbureter with nozzle size No. 70, Atwater-Kent ignition, Ward Leonard electric units, Carter gravity tank, Champion spark plugs and Firestone 34 by 4 tires. The tires finished with Pittsburgh air. Gargoyle Mobiloil B was used and only 2.5 quarts were needed to fill the crankcase on the arrival of the car in Milwaukee. No oil or water was taken on the trip from Pittsburgh until the car reached Milwaukee. A Boyce Moto-Meter and a spot light were the only equipment carried not regular. The gasoline used was such as could be obtained by an owner on the highway. The mileage was checked by speedometer readings, this speedometer checked at start and finish.

No Special Preparation

The car was not specially prepared for fuel economy test and used only regular equipment, except a spot light and a Boyce Motometer. Artemas Ward, Jr., president of the King company, in asking for an official sanction for this test specified that he desired it to be a car owners' fuel economy test. To be run under regular touring conditions. His request to the



King eight at finish of run in Milwaukee, Wis., August 15

contest board of the A. A. A. said: "We would like the American Automobile Association to run this fuel economy test under rules and regulations that would give the King a gasoline record such as an owner would obtain in touring. We do not desire a maximum economy record under this sanction."

One of the most interesting facts developed in the test is that the greatest mileage per gallon came in the most hilly part of the trip, that from Pittsburgh to Bedford, O., a distance of about 132 miles. The average mileage for this part of the trip was 15.5 miles per gallon, while the poorest showing was through the level part of Ohio, 94 miles between Bedford and Fremont, where the average was 13.84 miles per gallon. The remainder of the trip averaged 14.5 miles per gallon. The best mileage per gallon was made at speeds of 22 to 23 miles per hour. There was no perceptible difference in fuel consumption noted during the night part of the trip. The weather was fair throughout.

SUMMARY OF EIGHT CYLINDER STOCK KING ON THE ROAD FUEL ECONOMY TEST

From Pittsburgh, Pa., to Milwaukee, Wis.
Miles traveled, 616.4.
Gasoline consumed, 42 *gal.,* 7 *oz.*
Oil consumed, 2.5 *quarts.*
Water consumed, 1 *gallon.*
Miles per gallon of fuel, 14.658.
Miles per gallon of oil, 962.4.
Miles per gallon water, 616.4.
Tires finished on Pittsburgh air.
Miles per hour, including all stops, 19.44.
Miles per hour, excluding all stops, 22.67.
Number of stops at controls, 6. *Duration,* 2 *hours,* 50 *minutes.*
Number of stops between controls, 7. *Duration,* 1 *hour,* 41 *minutes.*
Work done on car start to finish: Tightened left rear hub cap.
Start 8 *a. m. central standard time Aug.* 14; *finish* 3:41 *p. m. central standard time Aug.* 15.
Drivers: T. P. Chase, A. C. Hamilton and K. D. Grindle.
Passengers: C. F. Gydeson, Houston, Tex.; Geo. J. Bates, H. C. Bradfield and E. J. Delahanty, Detroit, Mich.
Officials A. A. A.: F. E. Edwards and H. A. Tarantous.

KING ON NON-STOP RUN

Washington, D. C., Aug. 19—An eight-cylinder King touring car is making a 2-weeks' non-stop run on the boulevard between this city and Baltimore. The start was made at noon, August 12, from the plaza fronting the United States capitol, and at the conclusion of the first 168 hours' run had a mileage of 3,515 miles. The gasoline consumption has averaged 12.126 miles to the gallon. Baltimore and Washington dealers are promoting the run.

UNION BEARING SERVICE STATION

Detroit, Aug. 21—The Bearings Service Co. has been organized here to handle the service for anti-friction bearings for all types of motor vehicles and already has contracted with Timken, Hyatt and New Departure to conduct the service operations for these three large bearing manufacturers. The Bearing Service Co. in reality takes over the service operations of these three, and the idea is similar to that of the union railway station where competing lines enter a city.

The Bearing Service Co. is separate from the companies whose product it will care for. The Hyatt company has service branches in the principal motor centers, and Timken also has several such branches, but these will all be taken over by the new company, and it is stated that when, early in September, the Bearings Service Co. begins active operations, a union station will be opened in each of nine different cities. All will carry complete stocks of all of the bearings manufactured by the companies above mentioned. It is the plan to establish eventually union stations in fifty or more cities.

TIMKEN INTERESTS UNITED

Detroit, Aug. 21—The Timken-David Brown Co., this city, the majority of the stock in which was originally owned by the Timken-Detroit Axle Co., has been bought out entirely by the Timken-Detroit company, and the manufacturing operations will be consolidated under the management of the axle company. That portion of the Timken-David Brown stock, which previously was not held by the Timken Axle company, was owned by David Brown & Sons, Huddersfield, England, and the new move divorces the two. The Timken-David Brown Co. always has been regarded as a part of the Timken factories here, being under the same roof. It manufacturers worm gearing for motor trucks and power transmissions, and the gear generating machinery was brought over originally from Huddersfield.

To Build New Steamer

General Engineering Co. formed in Detroit to Market Car

Abner Doble Designs Steam Vehicle for New Concern

DETROIT, Aug. 21—Abner Doble, expert on steam motor cars, and at one time consulting engineer for the Stanley Motor Carriage Co., maker of steam cars, has arranged to build a high-class steamer in Detroit. He has associated with him C. L. Lewis, former president of the Consolidated Car Co., and M. J. Hammers, also connected with that organization. The General Engineering Co. has been organized with a capital stock of $200,000 to market a car after Doble's designs and also to license others to manufacture a steam car. Mr. Lewis is president, Doble is vice-president and Hammers is secretary-treasurer.

The results attained with Doble's steam vehicle are attracting wide attention here, and engineers of several of the prominent concerns have been greatly impressed with it. Three cars of a new design are now being constructed by the General Engineering Co., and these are to have two 30-horsepower two-cylinder uni-flow steam engines. Doble generates the steam in a generator under the hood, the heat being supplied by burning kerosene that has been previously vaporized. A hot point, electrically heated to red heat ignites the vaporized kerosene and forms a fire under the steam generator almost instantly the fuel and electricity are turned on. This steam passes to the engine mounted at the rear axle. There is a condenser, and the lubricant is introduced through the water.

Doble says that his engine runs 15 miles to the gallon of kerosene at 30 miles an hour; 4 miles per gallon at 100 miles per hour; and 8 miles per gallon at 60 miles per hour. One gallon of lubricating oil is good for 8,000 miles and the car runs 1,200 to 1,400 miles on a tank full of water.

A complete description of the car will be given in a later issue.

SAXON PAYS A BONUS

Detroit, Aug. 21—The Saxon Motor Car Corp. on September 1, will share a special bonus with its employes both in the office and factory departments, in accordance with a new plan just made public. This action is the result of the knowledge the Saxon officials have of the share the employees have in the success of any organization.

Office employees who have been with the concern for a period longer than 90 days will receive a bonus at the rate of 5 per cent of their yearly salary. Factory workers will share on a like basis, with the exception of those who have been paid a premium on the piece-work basis. These will get a bonus of 3 per cent. The Saxon Motor Co. plans for an output for the 1917 selling year of more than 60,000 cars. Contracts for 50,755 cars have been closed within the past 3 weeks with Saxon dealers. There is a definite monthly schedule of cars embodied in each contract which constitutes a bona fide order against which the concern can make shipments, which is a new feature for safety in dealer contracts.

CONSOLIDATED GOES TO CLEVELAND

Detroit, Aug. 21—The Consolidated Car Co., manufacturers of the Abbott-Detroit cars, has been reincorporated under the name of the Abbott Corp., and the capital stock has been increased from $500,000 to $1,250,000. The larger stockholders in the concern are F. C. Hull and A. W. Gardiner, of this city, and F. C. Hull, of Toledo.

The business of the Abbott Corp. will be moved to Cleveland, O., where a factory has been secured which will have ample facilities for the increasing of production over the fifteen to twenty-car-a-day output possible in the present factory here. Difficulties in getting materials and the labor situation here are given as two reasons for the change. The personnel of the company will remain the same, with the exception that an executive officer will be appointed to succeed C. L. Lewis, who recently retired from the presidency to become affiliated with the General Engineering Co.

Resta Takes Grand Prix

Sets 100-Mile-an-Hour Pace and Wins Easily
De Palma Has Broken Cylinder

Dario Resta inspects the gold trophy given him for winning speedway grand prix. This is the fourth trophy he has won on the Chicago course

By William K. Gibbs

CHICAGO SPEEDWAY, Aug. 19—With the same assurance that has marked his driving in every professional race on the local speedway, Dario Resta drove his Puegeot to victory again today, this time winning the American speedway grand prix. He drove against a field that he apparently did not fear, and after taking the first heat of 20 miles in 11 minutes 42.6 second, he went into the 50-mile final and won easily in 29 minutes 52.49 seconds, or at an even hundred miles per hour. In all, he drove 70 miles in 41 minutes 35.09 seconds, at an average speed of 101.01 miles per hour, pulling down the big end of the $10,000 prize money—$5,000—at the rate of $71.43 a mile.

Resta Drives with Assurance

There is a certain sense of security that is bred of experience and if this is applicable to racing, then Resta's previous record on the Chicago speedway may account for the assurance with which he drove today. With today's win he has chalked up five victories in as many starts on the local board oval; in fact, he has been winner in every race held here with one exception—an amateur drivers' event. In all, he has driven 1,054 miles on the Chicago track in competition and for this has taken down $51,000 in cash prizes as well as four trophies.

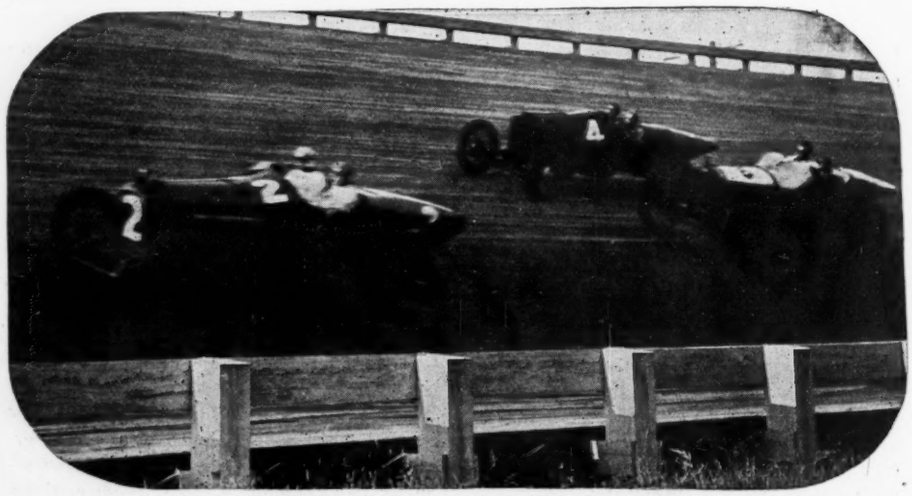
Elimination of Ralph de Palma's Mercedes in the third lap of the first heat, when a cylinder head let go, which removed Resta's only real competitor, came at a time when he and Resta were battling hard for the lead. Resta had the pole at the start and held the lead for the first 2 miles, de Palma passing him in the south turn on the second lap. Resta forged ahead of Ralph in the backstretch, de Palma was again ahead in the north turn and held his lead at the end of 4 miles, Resta being about a car length behind. De Palma led going into the south turn, Resta passed him again in the backstretch and in trying to regain the lead before reaching the tape, de Palma met his Waterloo and was forced to withdraw at 6 miles. After that Galvin, in the Sunbeam, jumped into second place and D'Alene, in a Duesenberg, was third. First, second and third position were held this way to the finish of the first heat, Resta being about 50 feet ahead of Galvin at the finish. All of the cars except de Palma's finished the required 10 miles to be eligible to start in the next heat, but when that mark was reached they did not extend themselves, preferring to save their cars. The heat was Resta's at 102 miles per hour, his time being 11 minutes 42.6 seconds.

One of the best battles of the afternoon

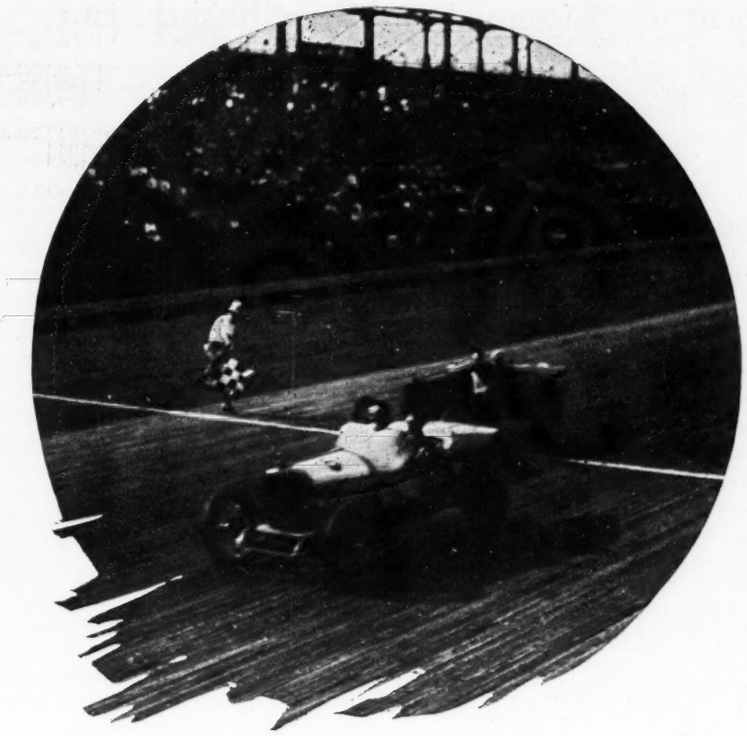
FINISH TIMES OF 50-MILE FINAL

Car	Driver	Time	Speed	Prize
Peugeot	Resta	29:52.49	100.42	$5,000*
Hoskins	Lewis	29:56.77	100.19	2,500
Duesenberg	Buzane	30:40.37	97.82	1,250
Sunbeam	Galvin	31:27.89	95.39	750
Duesenberg	D'Alene	32:03.41	93.58	500

*Also gold cup.



Resta, Lewis and Galvin in brush on south turn



Galvin noses out Lewis in second heat

was found in the second heat, which Galvin took in the Sunbeam in 11 minutes and 37.72 seconds, or about 5 seconds faster than the heat won by Resta. Galvin's speed was 103 miles per hour. Lewis, in the Hoskins, made Galvin give his mount all it had in it and there was a margin of less than a car length between Galvin and Lewis at the finish. Galvin, Lewis and D'Alene ran one, two, three all through the second heat.

Lewis took the third heat in 12 minutes 7.3 seconds, his average being 99 miles an hour. D'Alene and Buzane, both driving Duesenbergs, were second and third, respectively, all through the third heat. The fourth heat went to Buzane in 12 minutes and 27.68 seconds, his speed being 96.5 miles an hour. D'Alene crowded the little Greek hard, but could not head him. Milton brought his Duesenberg to the pits at the end of 14 miles in the fourth heat and Christiaens docked his Sunbeam at the end of 10 miles. The Belgian was having considerable trouble to get his car working right and finally withdrew at this point after having been a poor tail-ender in each of the first four heats. He managed to run the requisite five laps each heat, however, and worked on his car between heats to get the kinks out of a valve that insisted on sticking.

The elimination of Milton's Duesenberg with two broken valve springs and the withdrawal of Christiaens left D'Alene's Duesenberg the only car to start in the fifth heat. He made one circuit of the track and was declared winner of the fifth heat, which also made him sure of a piece of the prize money.

The winners of the heats, their time and speeds follow in the order of running:

Driver	Time	Speed
Resta	11:42.60	102
Galvin	11:37.72	103
Lewis	12:07.30	99
Buzane	12:27.68	96.5
D'Alene	Ran one lap	

There was little contest for first place in the final 50-mile dash, Resta taking the lead at the start and never giving it up but once—at the end of 36 miles Lewis led but only for a few hundred feet. Likewise there was no doubt from the first who would be the last to finish, for D'Alene could not get his Duesenberg to perform as he had earlier in the race. Resta was never far ahead of Lewis, Buzane and Galvin. These four kept well bunched and the latter three vied with each other for second place and furnished most of the thrills for the final heat. For example, Lewis crossed the tape ten times in second place; Galvin eleven times, and Buzane three. Lewis was third across the tape five times, Galvin ten times and Buzane ten. Fourth place was held by Lewis nine times, Galvin four times and Buzane twelve times.

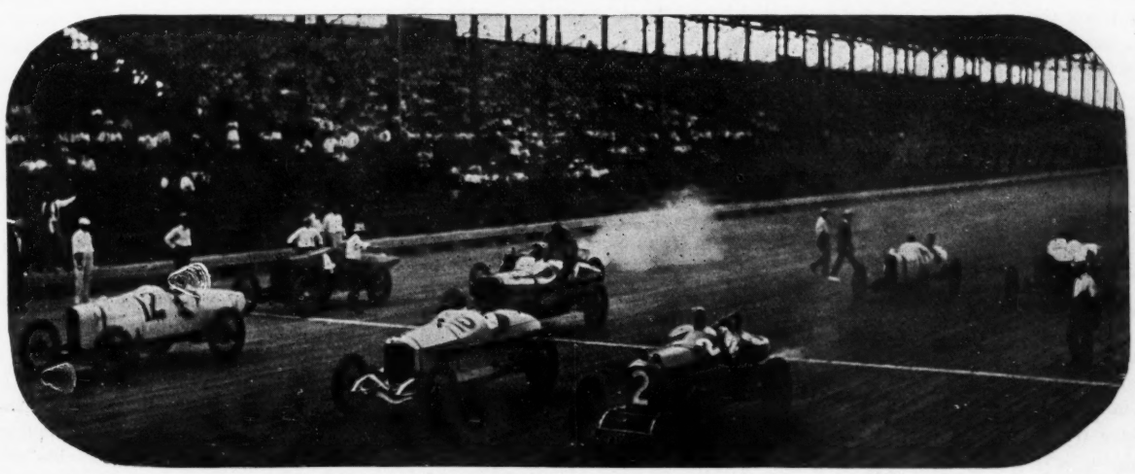
By reason of having won the fastest heat Galvin was looked upon as a close contender for first place in the final. He pushed Resta the hardest of any until he blew a right front tire in the 44th mile and was lapped by Resta while making the change. This was the only tire change of the day.

As an added feature the two Packards

RESTA'S RECORD ON CHICAGO SPEEDWAY

Date	Distance	Time	Speed	Prize
1915				
June 26	500	5.07:26.00	97.58	$23,000
August 7	100	58:42.20	101.86	5,000
1916				
June 11	300	3:02:31.64	98.61	13,000
June 18	84	50:31.20*	97.82*	5,000
August 19	70	41:35.09†	101.01†	5,000

* Total time for three heats and average speed.
† Total time for two heats and average speed.



Sending the cars away in the first 20-mile heat

Specifications and Equipment of Chicago Grand Prize Racing Cars

No.	Car	Driver	Bore & Stroke	Cyl.	Disp.	Carb.	Mag.	Plugs	No.	Pistons	Oil	Wheels	Tires	W.B.	Other Equip
2	Peugeot	Resta	3.70x6.65	4	274.3	Miller	Bosch	KLG	8	Alloy	Castor	R W	Silvertown	106	Moto-Meter
10	Mercedes	de Palma	3.70x6.49	4	278	Miller	Bosch	Bosch	8	Lynite	Monogram Castor	R W	Silvertown	112	Moto-Meter
8	Frontenac	Chevrolet	3.87x6.37	4	300	Miller	Bosch	Rajah	16	Lynite	Monogram	R W	Silvertown	104	Moto-Meter
14	Duesenberg	Milton	3.75x6.75	4	298	Miller	Bosch	Rajah	8	Lynite	Oilzum	R W	Silvertown	106	
12	Duesenberg	D'Alene	3.75x6.75	4	298	Miller	Bosch	Rajah	8	Lynite	Oilzum	R W	Silvertown	106	
4	Hoskins	Lewis	3.21x6.14	4	298	Miller	Bosch	KLG Rajah	8	Lynite	Oilzum	R W	Silvertown	106	Moto-Meter
6	Sunbeam	Galvin	3.21x6.14	6	299	Claudell	Bosch	Rajah	6	Lynite	Castor	R W	Silvertown	106	Moto-Meter
5	Sunbeam	Christaens	3.21x6.14	6	299	Claudell	Bosch	Rajah	6	Lynite	Castor	R W	Silvertown	106	Moto-Meter
3	Duesenberg	Brizane	3.75x6.75	4	298	Miller	Bosch	Rajah	8	Lynite	Oilzum	R W	Silvertown	106	Moto-Meter

that were scheduled to start in the race but which were withdrawn 2 days ago, were put on for a 10-mile exhibition, with Ralph de Palma driving one and W. Rader, one of the Packard engineering corps, the other. De Palma brought his car across the finish line somewhat in advance of Rader, Ralph's time being:

Miles	Time	Speed
2	1:16.70	94
4	2:23.70	107
6	3:30.35	108
8	4:36.00	110
10	5:43.50	107

Average 105 m. p.h.

In his qualifying trial Resta set the official course record of 113.5 miles per hour, a fraction better than Barney Oldfield did this summer with his front-drive Christie.

The crowd was not large and it is doubtful if a profit will show after prize money and the expenses of administration of the race are paid.

Grand Prix Mechanically Uneventful

No Blowouts Despite Blistering Heat

By W. B. Blood

CHICAGO SPEEDWAY, Aug. 19—From a mechanical standpoint, the Chicago speedway grand prize race was strikingly uneventful. What mechanical troubles there were, existed in most every case before the preliminary heats started, and the efforts of two of the drivers to repair their cars between heats was a real feature of the work at the pits.

Milton's desperate attempts to qualify his Duesenberg in one of the heats, took the form of a relay repair job between events. According to the rules under which the race was run, each participant had to go at least five laps in a heat before he could participate in the next one, and furthermore, he was obliged to appear in each heat or he would become automatically disqualified.

At the start of the first preliminary, it was apparent that Milton was in trouble. He covered five laps and stopped. The bolts were just nicely loosened on the right valve cover when the next heat was called and Milton limped off another five laps. More desparate labor and the cover was removed. Another five laps, in the third heat and then he was ready to go after the trouble. Examination revealed two broken valve springs and an effort was made to change them. Starter Wagner had a time limit to observe, however, and he could not wait for the completion of the repair, resulting in Milton's final cuckoo.

Christiaens in the Sunbeam went through something of the same process. A missing and backfiring motor led him to believe that his spark plugs were giving trouble. He changed all of his English-made K. L. G. plugs for American Rajahs. After taking part in four heats without being able to eliminate the miss he retired with what appeared to be a stuck valve, although details of mechanical troubles are hard to extricate from any of the Sunbeam racing crew.

The much-heralded Mercedes motor, brought to this country from Germany in the Deutchland, etc., which was really constructed in Detroit mostly by one Dutch Kline, carried the German car and its driver, Ralph de Palma, for three flying laps and laid down completely. This time it was was not a connecting rod, which is Ralph's conventional hoodoo, but was the piston itself, which blew out through the top.

Buzane's Duesenberg sprung a characteristic Duesenberg trick when the packing gland of the water pump let loose. This same trouble chased the Duesenbergs in the Chicago race in July. It is the old eight-valves that have the trouble, however, and it is evident that the fault has been corrected in the newer motors.

Despite the intense heat of the track which had been baked for several days under a blistering sun, there was not a single blowout. There are few long-distance races in which several cars are not in the pits before ten laps for new tires, but several of the cars, Dave Lewis' Hoskins Special for one, went through several preliminaries and the 50-mile final on the same tires. Galvin shed the tread of his right front, directly in front of the grandstand, during the final race, and this probably cost him second place. He completed the next lap on the fabric and came into the pits without a blowout. This only tire change of the day during a race was done with remarkable inefficiency, some 40 seconds all told elapsing between the time the wheel was jacked and the car was again on its way. The strips of tread which were thrown off were so hot that they could not be held in the hand, which convinced the writer at least, that the tires were standing up under unusually trying conditions.

It is in order to give an opinion in this story, of a nature more or less editorial, regarding the performance of the new Hoskins special in the hands of Dave Lewis. It took the driver three heats to win a race, but in the final he was pace maker for Galvin, who made the fastest time in the heats, and a constant squeezer of the tail of Resta's Peugeot, in fact Lewis led Resta past the stands during one lap, although the ease with which the winner passed the Hoskins on the next turn, changed the minds of any who might have thought that the Hoskins was the faster car.

Lewis drove three preliminaries, a total of 60 miles, and the final of 50 miles, or a total of 110, on the same tires, and on none of them were the ridges of the rubber casing perceptibly worn. If Lewis continues to campaign the Hoskins, it should be heard from in future events.

Moto-Meter readings showed that the cars were efficiently cooled in spite of the 100 degrees of atmospheric heat. At the finish of the 50-mile final, Resta's Moto-Meter stood at normal and the other cars equipped with the radiator thermometer kept their water well below the boiling point.

The races announced the return of three of the racing cars to the use of pure castor oil, these being the two Sunbeams and Resta's Peugeot. The stuff smells to heaven, and previous races, in which standard lubricants have been used, have been appreciated. There is consolation in the fact that there are no more combination odors of kerosene and castor such as the old Maxwells belched forth.

LEWIS PERSONALLY PAYS CLAIMS

Racine, Wis., Aug. 19—Capt. William Mitchell Lewis has given his personal check, amounting to 76.3 per cent of the value of claims filed against the L. P. C. Motor Co., to the assignee, that his promise made some months ago that creditors would be paid 100 per cent on their claims might be made true. At the time a voluntary assignment was made by the L. P. C. Motor Co., 11 months ago, Capt. Lewis gave creditors his personal pledge that none would lose a cent, and his action of this week makes good his promise.

Tries for Hour Record

De Palma Travels 105 M. P. H. for 32 Minutes—Out with Broken Valve

Mark of 94 Miles He Made Last June Considerably Exceeded

CHICAGO, Aug. 17—A broken valve stopped Ralph de Palma in his attempt to break the American speedway hour record today. De Palma holds the U. S. A. speedway record of 94 miles in the hour. Today he broke his previous figures for every lap and when the broken valve stopped him at the end of 56 miles he was considerably ahead of the previous record. Up to that time he had averaged 105 m. p. h. and undoubtedly he would have placed the record well beyond the century mark. He drove his Mercedes in which he won the 1915 Indianapolis classic, but used a new motor, a duplicate of the previous one. His times for laps were:

Lap	*Time*	*Lap*	*Time*
1	1:08.8	15	17:10.19
2	2:17.51	16	18:18.14
3	3:26.46	17	19:25.94
4	4:35.95	18	20:34.28
5	5:44.93	19	21:42.54
6	6:52.65	20	22:50.61
7	8:01.3	21	23:58.79
8	9:08.54	22	25:06.78
9	10:12.6	23	26:14.66
10	11:28.10	24	27:22.71
11	12:34.57	25	28:30.44
12	13:44.56	26	29:30.52
13	14:53.9	27	30:46.91
14	16:01.41	28	32:11.66

SPEEDWAY FOR COLORADO SPRINGS

Colorado Springs, Colo., Aug. 19—Officials of the Pike's Peak highway over which the recent hillclimb was held contemplate the building of a $100,000 motor speedway that summer tourists may have the opportunity of witnessing speed contests. Among the promoters of the enterprise are Spencer Penrose, Charles MacNeil and other millionaire sportsmen of Colorado. It is hoped to have the track completed this year. No details as to the location or kind of track have been given out.

MERCERS FOR SANTA MONICA

Santa Monica, Cal., Aug. 19—Five Mercers have been entered for the Vanderbilt and grand prize races to be held on the Santa Monica course November 16 and 18. Two of these will be 450 cubic inch displacement and two others probably new 300 cubic inch cars if they can be gotten ready in time. Eddie Pullen will be head of the five drivers. Two of the remaining four will be Ruckstell and Joe Thomas. This makes a total of six entries to date.

RELAY TRIP ROAD CRITERION

Chicago, Aug. 22—A relay tour over the Yellowstone trail from Plymouth Rock to Seattle to demonstrate to practicability of roads for long-distance transportation service and the efficiency of motor vehicles in times of national emergency will begin in a few days. This trip will be undertaken under the direction of the war department and an attempt will be made to cover the distance in 120 hours or less. A message will be carried from Plymouth Rock to the commanding officer at Fort Lawton.

In the run the war department requires the Yellowstone Trail Association to give data on the number of relays used, the sections covered by each, the running time on each section, whether by day or night, the details concerning the cars used, and the experience with each of them, having reference, more particularly, to the qualities of endurance and serviceability. All of these details must be reported to the commanding officer at Fort Lawton, Wash.

These relays are as follows:

	Miles
Plymouth, Mass., to Kingston, N. Y.	216.6
Kingston, N. Y., to Olean, N. Y.	332.2
Olean, N. Y., to Akron, O.	219.0
Akron, O., to Fort Wayne, Ind.	229.5
Fort Wayne, Ind., to Chicago	196.0
Chicago to Milwaukee, Wis.	96.0
Milwaukee, Wis., to Minneapolis, Minn.	494.0
Minneapolis, Minn., to Ortonville, Minn.	204.0
Ortonville, Minn., to Lemmon, S. D.	349.0
Lemmon, S. D., to Miles City, Mont.	257.0
Miles City, Mont., to Livingston, Mont.	287.0
Livingston, Mont., to Missoula, Mont.	268.0
Missoula, Mont., to Colfax, Wash.	260.0
Colfax, Wash., to Seattle, Wash.	371.0

MOTOR CAR BEATS LIMITED

Tacoma, Wash., Aug. 21—The 199 miles between Seattle and Portland have been covered by a motor car at the rate of 30 miles an hour, which is 13 minutes less than the time of the fastest limited train. The record was made by Ray McNamara in a Maxwell and carries with it the Chancelor & Lyon trophy.

Racing Events

*August 26—100-mile track meet, Kalamazoo, Mich.
*September 1-2—24-hour race, Sheepshead Bay.
September 4—Track meet, Newark, N. J.
*September 4—Speedway race, Cincinnati, Ohio.
September 4—Track meet, Elmira, N. Y.
September 4—Des Moines, Ia., speedway race.
September 4-5—Track meet, Spokane, Wash.
*September 9—Indianapolis speedway race.
September 16—Speedway race, Providence, R. I.
September 18—Track meet, North Yakima, Wash.
September 29—Track meet, Trenton, N. J.
September 30—New York, Sheepshead Bay speedway race.
October 7—Philadelphia speedway race.
October 7—Omaha speedway race.
October 14—Chicago speedway race.
October 19—Indianapolis speedway race.
October 21—Track meet, Kalamazoo, Mich.
*November 16—Vanderbilt cup race, Santa Monica, Cal.
November 18—Grand Prize race, Santa Monica, Cal.
November 30—Speedway, Los Angeles, Cal.
December 25—Speedway, Los Angeles, Cal.

*Sanctioned by A. A. A.

Cincinnati Field Good

Twenty-five Entries to Date and Some Others Are Expected

De Palma Expected to Be an Eleventh Hour Entry

CINCINNATI, O., Aug. 21—Special telegram—Twenty-five entries have been received to date for the 300-mile race to be held on the new Cincinnati, 2-mile board speedway, Labor Day. The field promises to be one of the best yet brought together for a speedway race this year, as it includes such drivers as Resta, Rickenbacher, Mulford, Merz, Wilcox, Aitken, D'Alene, Henderson and Chevrolet. To date de Palma has not entered his Mercedes, but it has been shipped to Cincinnati and will undoubtedly be entered for the closing date is midnight, August 26.

The opening race at 300 miles is for $30,000 in prizes and the entries to date are:

Car	Driver
Peugeot	Dario Resta
Maxwell	E. V. Rickenbacher
Dans L'argent	W. J. Muller
Hudson	Ira Vail
Duesenberg	George Buzane
Crawford	Billy Chandler
Peugeot	Ralph Mulford
Ogren	Otto Henning
Crawford	Dave Lewis
Olsen	Driver not named
Peugeot	Charles Merz
Premier	Howard Wilcox
Omar	Omar Toft
Peugeot	John Aitkin
Hudson Super Six	Driver not named
Duesenberg	Tom Milton
West Duluth	E. E. Rawlings
Cino Special	E. D. McNay
Duesenberg	Wilbur D'Alene
Hoskins	J. C. Hoskins
Maxwell	Pete Henderson
Duesenberg	Driver not named
Oberting	J. W. Oberting
Frontenac	Louis Chevrolet
Crawford	Art Johnson

HOOSIER RACE ENTRIES

Indianapolis, Ind., Aug. 21—Eddie Rickenbacher will drive a Maxwell in the harvest racing classic September 9. This makes seven entries to date as follows:

Peugeot..Chas. Merz	Premier...Anderson
Peugeot....J. Aitken	Premier...H. Wilcox
Maxwell.Rick'bacher	Ostewig...S. Ostewig
Sunbeam.Christiaens	

NEW WOMAN DRIVER MARK

New York, Aug. 22—Special telegram—Miss Amanda Preuss drove an Oldsmobile eight roadster across the continent in 11 days, 5 hours, 30 minutes. She left San Francisco August 8 at 6 p. m., being checked out by Frank Herman of the San Francisco Call, and arrived here August 19 at 2:30, being checked in by R. W. Sykes of the Brooklyn Citizen. The distance was 3,600 miles. She was the only occupant of the car and her time is said to be the fastest ever made by a woman in crossing the continent. She averaged 14 miles per gallon of gas. The mark surpasses the Baker record of 11 days, 7 hours and 15 minutes in 1915.

Makes Pike's Peak a Classic

A Criticism

CHICAGO, Aug. 19—Pike's Peak hillclimb of 12.5 miles should be the world's classic but the management will have to give more for the money charged or else the future climbs will go the way of several of our speedway races. There is no other place in the U. S. A. where a similiar climb can be held. The setting is unexcelled. There is a roadway with a minimum width of 20 feet and a maximum of 50 feet; the turns are 26 to 50 feet wide, the average curvature being 40 degrees; the grade is not too steep for spectacular speed work, the maximum being 10 degrees and the average 6; and two-thirds of the entire road distance can be witnessed from one place and there are many other places where stretches of several miles can be seen.

Prices Too High

With such a setting up a mountain of international fame it is regrettable that prices charged were out of the realm of reason and it is not surprising that the attendance was so small as to be designated a frost. Ordinarily you can ride up this Pike's Peak road on a sight-seeing motor bus and down again for $6.50, but on the day of the race the price was raised to $10 for the round trip. The price should have been lowered. To popularize the event the round trip price should have been $5. Events of this kind must be popularized and we are sorry that the management apparently fell into the speedway error of millionaire prices. High prices nearly wrecked several of our motor speedways and if continued can make a complete failure of Pike's Peak.

Here is what it cost you to get a view through field glasses, if you had them, of the cars at a distance of 1 mile. You paid $10 to get to the top and then had to pay $5 for a seat, $15 in all, or double the price of seeing the Indianapolis race from a box, which is generally classed as an expensive luxury.

$37 a Party

If you took your own car and had a party of four including yourself the total cost was $37 or over $9 each. You paid $3 per passenger, $5 each for a seat at top and $5 for a space to park your car and from which space you could not see any of the race. It was just a dead parking privilege.

No thought of anything but friendly criticism that will be for the benefit of all concerned is intended, for it is fully realized that the executives in charge of the event had nothing in this country to pattern after. It was a much different proposition than that which has confronted the different speedways in handling their initial races. Here are physical conditions that present real problems and the key could not be found for the problem through comparison with some like event in America, for there never have been any hillclimb courses in this country that could approximate the one up Pike's Peak.

Speedway officials have been able to profit by observing the conduct of races on other similar ovals, but not so with the Pike's Peak officials. Therefore, while it must be admitted that they fell short of the mark in some respects, their shortcomings can be partly condoned by reason of their lack of experience, or their inability to find a similar problem and learn in advance how it was solved.

As to the times made and the comparison of results in the climb up Pike's Peak, that is a matter that will be taken up briefly a little farther on. At first let us look at the hillclimb from the point of the spectator, for who can deny that it is the spectator that makes the race, at least so far as the promoters are concerned and it is of the promoters that we are speaking. Those of you who saw the events on the Peak August 11 and 12 will bear us out in the statement that unless something can be done within the next 12 months to bring interest in the event up to a higher level than that which any spectator carried down with him after witnessing either days' meet, climbing Pike's Peak will never be a successful venture, from an attendance standpoint.

Too Far From Course

In the first place spectators were placed too far away from the course. It is an ideal thing to keep the spectators at any race well away from the dangers of the course, but not so far away that they cannot distinguish one car from another, even by the numbers. Why does a person want fourth or fifth row seats in the center of the parquet when he goes to the opera. Is it because he wants to hear better? Hardly, because in the majority of theaters one can hear as well in the tenth or fifteenth row as he can in the fifth. He demands seats near the front because he wants to see the actors at close range, and this is just as applicable to the race or hillclimb fan as it is to the theater-goer.

People who paid their money to see the Pike's Peak hillclimb did not get their money's worth. True there was a wonderful vista spread before them, but they did not pay their money to look at scenery, they paid to see a hillclimb that was supposed to be spectacular, a hillclimb that would be worth all of the fee they paid and more—but they did not see such a spectacle. This is the reason!

Very few people were allowed to witness the climb from any point but in Mile 14 of the course. Here a road branches off the course and takes one about 2 miles around a rocky promontory to a saddle between two peaks, from which nearly all of the course from near the start to a point within 4 miles of the summit may be seen; that is, the general outline can be followed, but the closest—we may be criticised for this statement, but it is our best judgment—one gets to see a car in action is more than a mile as the crow flies.

Climb Poorly Handled

Now as to the method of running the climb. There is nothing to say against the field; it was of good caliber and the drivers were in earnest, at least most of them, but the most inexcusable part of the whole meet was the lack of rapid-fire action in starting each day's events and also in starting the different groups of cars so far apart in each climb. If you go to the theater and the bill is scheduled to start at 8:15 o'clock, you become impatient if the curtain does not go up at the appointed hour. In justice to those who go to see a race it should start on time—not an hour and a half late. Then again, the practice of starting cars in each group at intervals of 5 minutes so detracts from the interest in the climb that spectators will not go away and advertise this climb among their friends and acquaintances as they would if it had shown the rapid-fire execution that the West is noted for. That you may get the situation more clearly in mind, let us say, that the Pike's Peak course measures approximately 12½ miles from the start to the finish line. The average time to cover this course, we will assume, is 20 minutes. The entry list for each separate climb is divided into groups of four and one car sent away every 5 minutes. Thus it will be seen that the first car away is about 3⅛ miles on its way when the second car is sent away and approximately this distance separates each car in the group, assuming that all run at approximately the same speed. With this arrangement none of the cars will overtake and pass another unless the one ahead goes out, so this handicap precludes any possibility of brushes in a 12½-mile course.

Course Amply Wide

At no point is the course less than 20 feet wide and in many places it is 50. With the tread of cars 56 inches, four cars could stand abreast on the track at any point, so it seems feasible for one car to overtake and pass another at speed without any serious difficulty. The course has been laid out so that about 200 feet of the road is always visible to the driver and should anything block the course, if proper flagging arrangements were made, any driver with good brakes could bring his car to a standstill without incurring any great risk. He is always traveling up grade and seldom at a speed greater than 45 miles an hour.

Not very many of those who saw the

first Pike's Peak hillclimb will care to see another unless they are given some assurance that some exciting features can result, and the possibility of these can be injected into the succeeding meets only by starting the cars closer together and in larger groups. Perhaps the distance from which the climb was viewed this year would not be so objectionable if three, or even two cars could have been seen at a glance, but watching four cars stretched out at rather regular intervals over a 12-mile course and traveling at a speed that was scarcely greater than that at which most of us drive our own cars over country roads cannot arouse much enthusiasm, especially when in the best view one gets the cars are so far away that they look like toys.

Course Has No American Parallel

Of course, one must not lose sight of the fact that the physical conditions of the Pike's Peak course have no counterpart in other hillclimbing courses of this country, and the matter of handling spectators is one that calls for much study. However, there is one course in Europe that is fully as difficult and another that is almost the equal of Pike's Peak. The Mount Ventoux climb that was an annual feature in France before the war put motor sports out of the running, was over a course that is longer and more steep than Pike's Peak. The Mount Ventoux course measures 13.4 miles, whereas the Pike's Peak course is a little less than 12½ miles. The grade on the French course is somewhat greater than that of the Colorado course. The first 3½ miles of the former is not very difficult, but the balance averages 9 per cent. The last ½ mile is very steep—about 14 per cent. The Pike's Peak course does not exceed 10 per cent at any point and the average is a little over 6 per cent. The Semmering climb near Vienna, Austria, measures 6.2 miles, has many sharp turns and the grades run from 5 to 10 per cent.

However, on these courses abroad the public is allowed all along the course. It would not be a difficult matter to fence in parts of the Pike's Peak course, that is places where considerable of the roadway can be seen and allow the spectators to see the climbs from the places. It seems that it would be far more interesting to see a part of the climb from close range than to locate all the spectators at one point, at least when the point now chosen does not permit a full view of the course. Neither the start nor the finish can be seen from the present parking spaces and boxes.

Considerable comment not especially favorable to the climb management was heard from the drivers. They resented the delays between starting the various groups. Of course, they did not object to the manner of sending the cars away, for with a comparatively clear course before them they figured they could make better time. However, they learned something about hillclimbing on Pike's Peak this year that they did not know before. If they profit by their experience some better times may be looked for next year. The average speed of Salzer's Mercedes at the last Semmering climb, September 19, 1909, was 52.2 miles per hour, while that of the first one there in 1899 was only 16.8 miles per hour. Bablot in a Brasier holds the record on the Mount Ventoux course. He negotiated the 13.4 miles of average 9 per cent grades in September, 1909, in 18 minutes, 41.27 seconds. The nearest approach to that mark was made by Georges Deydier in a 100-horsepower Cottin-Desgouttes in August, 1911, when he climbed the course with the 5,246 feet vertical raise in 19 minutes, 42.4 seconds. Lentz time at Pike's Peak was 20:55 and Mulford's 18:47.

Better timing arrangements for a climb of this kind are desirable. The error which required Parish's Mercer and Oldfield's Delage to go back to the starting point the first day, after they had reached Glen Cove, because their times had not been taken at the start, is one that will not taste well in the mouths of drivers if it occurs often. Two perfectly synchronized timing devices—one at the start and one at the finish—could be arranged just as easily as the various electric clocks throughout the country are synchronized.

Better Announcing Facilities Needed

Another thing that the management of the Pike's Peak hillclimb should arrange for before next year is adequate telegraph and telephone equipment that the world may learn of the progress of events just as it does of the speedway races. New York Sunday papers did not get results of the climb in time for use. This probably is true of many other cities. The only telephone line to the finishing point of the race on the summit of the peak was used for timing and this left much-to-be-desired results lacking until after the events were over. There were no telegraph wires.

If there had been enough interest in the climb at any time to have elicited a cheer one would have thought less of the money they gave up to see the climb. The first day of the meet the boxes at the parking space—there were probably 200 platforms with capacity for about six persons each, fastened to rocks on the mountainside—were not especially attractive. Most of those who drove their own cars up found they could not sit in their cars and see the race. They could not get their cars near enough to the edge of the slope to see the course. They took their robes and blankets, spread them on the side of the mountain, dug their heels into the dirt and put in an uninteresting day of it. Occasionally they saw a moving object on the course and it took careful scrutiny and often the aid of field glasses to tell whether the object was a racing car or a motorcycle patrol. Charging for parking space that is not where one can see the race from his car is not good business policy. It may help fill the promoters' coffers once, but the same man will not be likely to buy a second time. There is no other way to get on the course except in a motor car. The promoters have limited equipment with which to carry a crowd to the course, therefore, it becomes evident that people must go in their own cars, but unless they can sit in their cars and see the events, no parking fee should be charged.

What Must Be Done

Summing up, these things are necessary to make the Pike's Peak hillclimbs the classics they deserve to be: Make better arrangements for the public to see the events. Give the people something to excite them by starting the cars closer together and making the groups larger. Start the events on time. Arrange proper signaling facilities so that when the last car in one group reaches the top the first of the next group can be sent away. The mistakes of the first climb can be excused on the ground that those who handled it lacked experience, but a repetition of these mistakes from year to year will sound the death knell of Pike's Peak hillclimbing.

The course is ideal for hillclimb meets. The road is hard and does not cut badly on the turns, of which there are more than a half hundred. The disintegrated granite surface is little affected by water and all the way the road is wide enough and the curves sufficiently banked to permit of good speed with a minimum of danger to car and driver. Let us hope that next year we will see conditions changed, that the drivers who are billed to appear are really there and have cars to drive, that there will be an attendance which a competitive climb up Pike's Peak merits, that those who attend will feel they get their money's worth, that prices be lowered or facilities for handling the people are bettered—preferably the latter, and that a good working program is formulated and lived up to, to the very letter. That will spell success for future climbs up Colorado's famous peak.

MASTER CARBURETER TESTS

Chicago, Aug. 19—Reports of fuel tests made by nearly 200 representatives of the Master Carbureter Corp., on August 1, and just made public, show high efficiency from the use of the Master carbureter. These tests were made on all types of cars, first running the car on a measured gallon of gasoline using the car owner's carbureter, then fitting a Master and consuming a similar quantity of fuel. Some of the mileages gained in various parts of the country follow, the figures given being the mileage shown by using the Master carbureter:

Town	Car and model	M.P.G.
Phoenix, Ariz.	Pope-Hartford, '09	31.7
San Francisco, Cal.	Overland, 59	20.0
Nashville, Tenn.	Overland, 83	15.4
Portland, Ore.	Cole six, '13	12.4
Salt Lake City	Haynes six, '16	22.4
Los Angeles, Cal.	Buick, '16	22.3
Boston, Mass.	Dort, '16	28.0
New York	Chandler, '16	15.8
Denver, Colo.	Ford, '16	22.0
Tulsa, Okla.	Ford, '16	24.0
Baltimore, Md.	Studebaker six	16.25

Buenos Aires, the Queen City

New plaza in front of Congresso in the heart of the city. Plaza built in 90 days

Metropolis of the Argentine Is the Largest South of the Equator and the Most Progressive

By David Beecroft

Editor's Note—This is the fifth of a series of articles on South America by David Beecroft, managing editor of Motor Age, who has just completed a lengthy trip through the Argentine, Uruguay and southern Brazil. In the preceding article, published in Motor Age issue of August 17 the author considered the truck in Argentina.

ARGENTINES take a special pride in calling Buenos Aires the Queen City of the Southern Hemisphere. They are justified. Buenos Aires is the largest city south of the equator and it is the surprise of every one taking the South American trip. There is nothing else in South America to compare with it. It is the alpha and omega. Rio de Janeiro may have its wonderful setting in a huge ampitheater of mountains but the city cannot be compared with Buenos Aires.

Buenos Aires means "good air." Rio de Janeiro means "River of January." All through South America you find name peculiarities. It is just as sensible to call New York "Hudson River" as to call Rio "River of January," or to call Chicago "Lake Michigan" or "Windy City" as to call Buenos Aires simply "Good Air." But you soon lose sight of these name peculiarities; even the natives fail to note the peculiarity.

Street Nomenclature

Names generally are peculiar in many of the South American cities and do not be disappointed in finding streets named after great events and also after great men. Naming streets after great events is unusual; we do not know of it in North America, but it is common in South America. May 25 is the national holiday of Argentine. It corresponds with our July 4. To Argentines the month of May as well as the 25th is important enough to have streets and plazas named after it. Thus the great avenue of Buenos Aires is called "Avenida de Mayo," which means Avenue of May, or May avenue as we would commercialize it. Avenida de Mayo is the Pennsylvania avenue of Buenos Aires. It is about 1.25 miles long and over 125 feet wide. At one end of it is Congresso, the congress of Argentine and corresponding to our capitol in Washington. You will note a similarity in appearance.

At the opposite end of this Avenida de Mayo (Ah-ven-e-da, de Mi-o) is the government building in which the president and all of his ministers have their offices, this building corresponding to the White House together with several of the other buildings that group around it at one end of Pennsylvania avenue in Washington.

Avenida de Mayo with Congresso at one end and government offices at the opposite forms the heart of the city. It is the Place de la Opera of Paris, the Pennsylvania avenue of Washington.

A Record Work

Argentines were not content with just a wide avenue leading from its legislative department to its executive departments but decided to create a huge plaza in front of each. The plaza in front of Congresso is illustrated on this page. It was made in 90 days and required razing all of the buildings on four blocks. It is only

BUENOS AIRES

Mestre & Blatge is one of the largest accessory stores in Buenos Aires and one very favorably disposed towards U. S. A. This large supply house, in addition to carrying a large assorted line of motor car accessories, sells one or two makes of cars and handles one line of motor trucks. Its stock of merchandise also includes much raw material as gear blanks from which gears of any size can be cut, other forgings, castings, sheet steel, bar steel; in short, all kinds of materials from which to make parts

In the Buenos Aires depot of the General Motors is carried a very complete supply of spare parts for Buick, Oldsmobile, Oakland, Cadillac and others of its line. This supply is adequate for all of Argentine, Chile and several of the other South American countries and is an essential of good motor car business in those countries

A morning sight at the municipal slaughter houses, showing a few of the motor cars lined up at the entrance. Cattle buyers drive to the slaughter houses in their cars each morning. Many of these cars are U. S. A. models. These municipal slaughter houses are entirely distinct from the large slaughter houses of Armour, Swift and three or four others located in different parts of the outskirts of the city

Buenos Aires has several large taxicab garages, all of which are models of order, cleanliness and good business. This shows about one-quarter of one of the large ones, which is entirely filled with Renault cabs. There are eight such rows of cabs, and they are always as orderly as shown. The cars were not arranged for this photograph

The Jeffery motor car stands in front of Fehling Hnos., or Fehling Bros., the Buenos Aires agents for Cadillac and Jeffery. This is a Sunday photograph and you notice the heavy steel shutters over the windows. All Buenos Aires is so locked up on Sunday. It applies to all other South American cities as well. Not only are all motor car establishments so closed up but stores of all descriptions. It is the exception to see a glass window exposed on a Sunday or holiday. These heavy steel shutters give a very much closed-up appearance to the city and naturally tend to keep inhabitants off the street on that day. In some cities where shops close at noon these steel shutters are drawn

about 6 years old and will soon be one of the picture places of the capitol. At the opposite end of Avenida de Mayo is a similar plaza. These plazas make excellent breathing places in a city which is built on the banks of the River Plate on ground as level as Chicago is built upon. Buenos Aires might well be called Plaza City as there are over seventy plazas of one kind or another. Each year sees new plazas laid out and it is remarkable the speed with which old buildings are wrecked and ground leveled, trees and shrubs planted and monuments set up. These plazas give the city a peculiar characterisic and make it an ideal city for motoring. New plazas are being built in the proximity of railroad depots and other points where congestion is apt to occur.

More Street Names

But Buenos Aires has other streets whose names have a national significance, thus there is "Calle 25 de Mayo." This means simply Twenty-fifth of May street. In the same way we might name some of our leading streets July Fourth street. This national spirit is found in every South American city. In Montevideo the National day is July 18 and the main avenue is Avenida 18th of July. The number Thirty-three is a favorite in Uruguay as thirty-three men from Argentine assisted Uruguay in throwing off the Spanish yoke. Because of this there are streets called Treinty Tres, which is the Spanish for thirty-three. There are cities, towns, villages and provinces called Treinty Tres. It is a real national name.

In Buenos Aires the constitution was approved on July 9, 1816, just 100 years ago and so you find many streets in Argentine cities and towns called Calle July 9, the word calle meaning street in Spanish. September 5 is another important date and you see streets so named.

National heroes are not neglected and those streets not named in commemoration of important dates are named after heroes. The George Washington of Argentine was San Martin (San Mar-ten) and you see his monument in every city and town. One of the leading plazas is named after him and generally one of the best streets. San Martin was the hero of South America 100 years ago when all of the countries threw off the Spanish yoke. The honor of freeing all of South America goes to Napoleon Bonaparte, the great French general who held the premier position in the great European wars of just 100 years ago. It was the success of Napoleon in Spain and other countries that gave all South American countries the thought of independence. Argentine was a leader and San Martin was the great moving spirit. Not only did he succeed in getting Argentine to throw off the yoke but at once went to the aid of Uruguay, Chile and others of the smaller countries that did not feel large enough. There are many other national military heroes whose names now hang on streets, and nearly every president has been similarly honored.

After Avenida de Mayo the next street that every tourist looks for is Florida. We would call it Florida, the same as the name of our state, but in Buenos Aires it is pronounced Floor-e-dah. Florida is a very popular name in all South American cities and you frequently find towns so named. It means flowery.

Florida has the distinction of being neither a street nor an avenue. It is just Florida as Broadway, New York, is simply Broadway. You spoil either to think of adding either street or avenue.

The Shoppers' Delight

Florida is the greatest shoppers' street in South America. The street is only 33 feet wide with sidewalks just wide enough for two abreast, but that width is its salvation, for every day between 4 and 7 in the afternoon all vehicles are forbidden to run on Florida so that during those three fashionable shopping hours the people own the street with sidewalks and fill it from wall to wall. Along Florida are the finest shops in South America. Here are the great department stores, Harrods, a branch of the London house of the same name at one end and near the middle two or three other big department stores. Harrods has a more elaborate interior than Marshall Fields but is not so large. It is a 7-story building. Gath & Chaves, another English shop, has two or three big stores that are models of their kinds and generally all stocked with the finest goods that Europe can produce. We say Europe, because U.

Avenide de Mayo—the Pennsylvania avenue of Buenos Aires, with congresso at one end and government building at the other end

S. A. is not very strong. We have a reputation for hats and shoes, but outside of that our reputation is largely as a good place to slaughter beef, fine for the manufacture of agricultural machinery, steam engines and a few of the other coarser necessities.

But when Argentine thinks of fashions, fine silks, fine gloves, pearl necklaces, diamonds, silver plate, hats and furs the mind goes to Paris, London and Berlin. New York is not associated with such. Argentines do not know of our finer lines of goods and they were little interested in them until the war, when the supply from Europe stopped. Today, times are changing. We are a little more in their eye. New York looks a little more attractive. Palm Beach is now considered whereas only the European Riveria was thought of.

Before the war, Argentines never thought of coming to U. S. A. except by way of Europe. It is just as far from Buenos Aires to Liverpool as it is to New York, but that made no difference. The trip from Buenos Aires to New York was made by way of London, Paris or Berlin. True, it took a week or 10 days longer but the steamboat ticket was not more. The English, French and German boats all gave tickets by way of Europe for the same rate as tickets direct. Europe wanted the Argentines and did not want them to go to U. S. A. so they made sure that if they were going to U. S. A. that they would get them to London, Paris and Berlin first.

It was more attractive to go to New York by way of London, Paris or Berlin than to go direct. You had much finer ships, in fact, as fine as could be desired. The boats direct to New York were second class.

Buenos Aires has a helter skelter motor colony. There is no motor row like Michigan avenue, Chicago, upper Broadway in New York, or Commonwealth avenue, Boston. Motor car salesrooms in Buenos Aires are scattered in the four corners of the city. There is no place you can say there is even a semblance of a motor row, excepting on a street called Peru which forms a continuation of Florida, the shopping street. Florida crosses the Avenida de Mayo, but once across its name becomes Peru and its character changes from a shopping center to a machinery row with such firms as J. I. Case, Fairbanks Morse, International Harvester, and large English and German houses handling every line of farm and mill machinery. On this street are such agencies as Argyll of Scotland, Napier, and several motor boat agencies as well as houses selling gasoline engines.

The remainder of the motor car houses are in east, west, north and south parts. The Cadillac agency, the dean of U. S. A. agencies, is by itself several miles from the heart of the city. There is no other agency within a mile of it. It has been represented there for 14 years, Fehling Bros. having it all of the time. On the other hand, Studebaker has taken a place on Avenida de Mayo, right in the heart of the city and has a salesroom as fine as you would see in Kansas City or Minneapolis. There is a retail selling force, telephone exchange and every detail you might look for in a store in St. Louis. From this place the entire Studebaker business for South America is managed. The position should be one of the finest in the city.

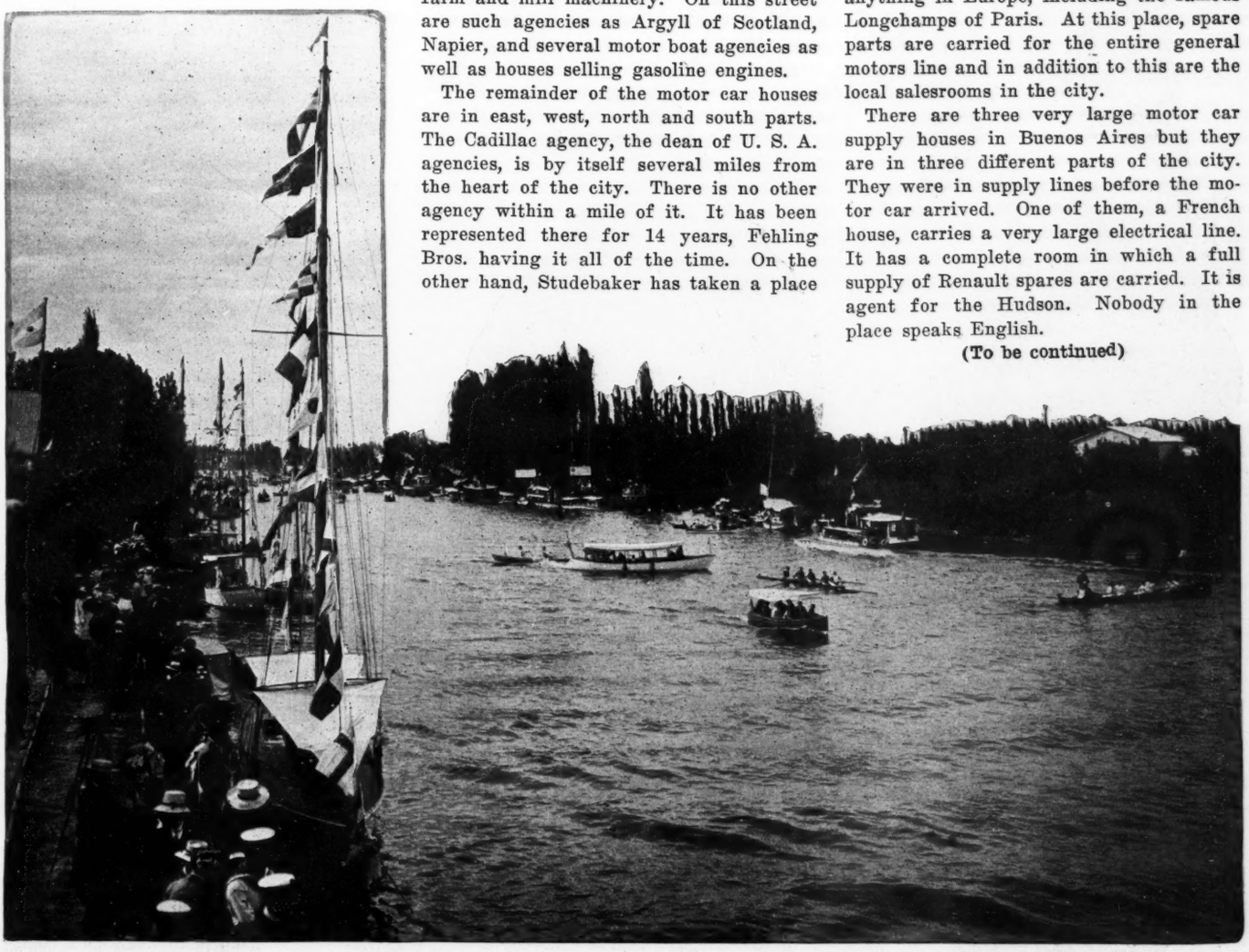
Overland is about 5 minutes from Studebaker and is located on the great plaza in front of Congresso, shown on another page. It is an ideal location and Hardcastle, the Overland dealer, is endeavoring to have two sides of this famous plaza converted into the Buenos Aires motor row. If such were accomplished, it would be the greatest motor car advertisement in Buenos Aires. It would be ideal for a motor row, no street cars, very wide streets along which the motor cars pass in constant procession. Not more than a block from Overland on this plaza is the Bosch magneto house, which has a fine corner. A block back from the plaza is the Saxon agency.

Three Supply Houses

The General Motors service depot is located in a suburb near the famous Buenos Aires Jockey Club race track, the finest in the western world and perhaps finer than anything in Europe, including the famous Longchamps of Paris. At this place, spare parts are carried for the entire general motors line and in addition to this are the local salesrooms in the city.

There are three very large motor car supply houses in Buenos Aires but they are in three different parts of the city. They were in supply lines before the motor car arrived. One of them, a French house, carries a very large electrical line. It has a complete room in which a full supply of Renault spares are carried. It is agent for the Hudson. Nobody in the place speaks English.

(To be continued)



Tigre, the motor boating and recreation ground of Buenos Aires. It is some miles out along the Plate river

From the Woman's Viewpoint

Advance Fall Styles Which Forestall Modes of the New Season

By Ruth Sanders

MADAME Georgette cables from Paris that velour will be the premier material this fall and winter, so this Bernard model of green wool velour is particularly proper as a harbinger of what the fall will bring forth. This motor coat is lined throughout with fancy brocaded lining. There is a distinct change in one particular. You will notice, from the plaid coat as well as from this one, that the curve of the waist line is signified. This also is chic, for it is one of the noticeable changes in the clothes dictum.

For, while the weathervane of styles points to few changes, those few changes are to be observed. The skirts are to be slightly longer, though they are still to be full. The waist line will be higher than ever. Coats are lengthened with the skirts, and they, too, may have the higher waistline. But there is a change in the waist treatment itself. Gone are the straight up and down lines for the most part; the cut or a sectional belt must echo, at least faintly, the small waist of yore.

The shortage of materials, due to the war, will have no effect, the modiste says, and you can see she is right when you look at the two coats shown here. Other coats are even fuller than these, containing much of the side-pocket and full-gathers effect of the summer skirts. The three-quarters length promises to be the most popular. Notice this coat in large black and white over plaid material. Observe the full flare back that is shown, and do not overlook the feature of the belt drawn rakishly across the front, giving just a hint of a waistline.

Collars are more artistic than last year. They are large, but they do not hug the neck so closely. Those on these coats are good examples.

With these two coats as samples of what

one will have to pick from this fall, you can see the smart effects to come later. And when the early fall days invite you to forsake the city streets and follow the open road, you can throw down your own challenge with the color of the green velour or the plaid of the other. For vivid colors and the unusual are predicted. The autumn will probably offer no more vivid colors. True, the coat must be warm and comfortable at the same time, but the color of this warmth and comfort bids fair to return nature's compliment.

It is understood that the cape will again be a distinctive feature of the motoring and traveling coat. It is rather early yet to speak of capes, though one is already looking forward to the soft furs which are to be so much in vogue next season. The rippling cape will be worn, and this promises an attractive motoring coat later on.

So, let the fall bring what it will in the way of motoring since the motorist is to be looked after by the modiste. With such coats and capes as are promised, it will be a real temptation to get out in the open. Taking these two wraps as fair examples, one can be perfectly warm and comfortable and yet have no feeling of wearing something "bundlesome," a condition often arrived at in the early days of motoring when there were not so many provisions for the one who motored.

These two coats are from the Garment Specialty Co., New York, and the woman motorist can well take them for desirable samples of what will be worn later on.

COLOR IN A NEW ROLE

Red as a favorite color has long held its position as king of the paint box. As an accessory for the motorist, however, it is not so well-known. The main benefit is reserved for the woman, for red has long been restrained to an occasional tie or other small note in men's clothing.

Tourists in the hotter sections were the first to discover and make known the impunity to be derived from the use of red as a protection against the sun. A single thickness of chiffon prevents any sunburn whatever. Orange is an even better color, taking precedence here at least over the king of colors. But orange is not so popular a color, and the tourist in the Southwest and far South more often wear the red veils.

While it might be rather unusual to wear the bright, flaming colors in the city haunts of man, for the touring trip they are extremely desirable. Moreover, the woman who dares draw the attention of many can insure herself against sunburn and freckles by wearing such colors even on the city boulevards.

The principle is the same as that which leads the photographer to use the red or orange lantern in his darkroom. Its use is equally as fit for the woman motorist as for the photographer, especially if she has a delicate skin.

Beauty Hints for the Woman Motorist

No. 2

TO protect your skin from the sun and the wind, always apply a good cold cream to your face before starting on a trip. Even if you do not use it at home, you will need it when motoring. Remove the superfluous cream with a soft cloth or towel. Then, when your face has dried thoroughly, dust it with a pure powder. Sounds simple enough, doesn't it? And it is simple. The trouble is too many women forget that the tan so easily acquired usually proves less easy to remove.

These precautions are only temporary, however, though they do serve their purpose of protection. If you desire a good skin during the summer season of skin susceptibility, you must attend to your skin every night and morning also. Three cold creams may be used to advantage in connection with one another: a cleansing cream, a cream for drying the skin and contracting the pores, and a whitening cream. Wash the face well with hot water each night, dash it with cold water and when it is dry, use the cleansing cream. The pores are thus able to throw off the deeper deposits of dust, which the soap and water did not reach. As soon as you have smeared the cleansing cream into all the cracks and crevices, wipe it off with a soft cloth.

Rub this cream into your face for half an hour every night; leave it on until you go to bed and then wipe it off with a soft cloth. Perhaps your skin is naturally dry; in that case you do not need an astringent. Or you may prefer alcohol, or some other liquid astringent. Alcohol is excellent for this purpose. Grain alcohol is the kind you use. It takes very little to do the work, and this little should be dashed on, without rubbing, much as the cold water is. Witch hazel is also a pleasant astringent. Use the whitening cream when the skin is perfectly dry. Rub it in for 15 or 20 minutes; then wipe your face dry. After a short interval, apply powder.

Harem Veil and Outdoor Oilskins

HAREMS and motors! What is more contradictory? Yet, we can conceive of the woman motorist adopting the styles of the harem if it suits her fancy, and this is just what she has done now.

Closely akin to the harem veil is this "Peek-a-Boo" veil which so clearly recalls barred windows, soft voices and strange Oriental perfumes. It is a veil creation by E. & Z. Van Raalte Company and is expected to prove a blessing to the woman motorist.

How does it work? Why, some chiffon is worn down over the mesh, thus protecting the face. The eye-space, you see, gives clear vision through the chiffon.

From chiffon to oilskins is a far cry, but the motorist meets fair and stormy weather, too. Sometimes this sport suit from Stern Brothers will serve better than the more novel "Peek-a-Boo."

For, like her oil-skinned brother of the fishing-smack, she will scorn the elements and their misbehavior. And when it comes to tramping or driving with rain in her face—what's better, anyway?

So, in these two motoring "accessories" Milady may find something a little out of the usual to wear on her rounds, whether it rains or shines. The veil goes best on a small hat, of course. The suit is to be worn over breeches or a heavy skirt.

The Readers' Clearing House

REPAIRING AIR STARTER USELESS

Task of Keeping Joints Tight Makes Such a System a Nuisance

AUSTIN, Tex.—Editor Motor Age—I intend repairing the air starter on a Chalmers 30 roadster, 1912 or 1913 model, and to use an engine-driven pump to supply the tank pressure. Would this starter turn the motor fast enough to start the car on a Bosch independent magneto without batteries, considering that the magneto is in good condition and the plug points set normal?

2—In dealing with the second-hand magneto exchanges is there any manner of testing coils to see whether they are in serviceable condition or not?

3—As you may know, this model of car is equipped with 35 by 4-inch tires. As this is a very hard size to get in most small places, would like to equip with 34 by 4 rims. Is it possible for me to obtain 34 by 4 rims anywhere which will fit this wheel without alteration? Continental Gilbert type were originally used. If so, where may they be obtained?

4—In replacing differential master gears and pinions on this model, would it be practicable, in your judgment, to secure those cut on the spiral-bevel plan, or not? Considering that the service brake is attached to drive shaft? If so, where may these gears be obtained?

5—In fitting aluminum pistons to this model, would it be practicable to reduce the weight of connecting rods, and if so, in what manner may this be done, and to what extent should it go in order to remain safe?

6—Would it be possible to attach an oil radiator, and would such an arrangement with fins exposed to the air be of any advantage in cooling? Where might such be obtained? Would it be possible for a skillful tinner to improvise such? If so, could you furnish sketch?

7—Will ordinary copper pipe such as is used for gasoline leads, be strong enough to hold pressures of this starting system, particularly those to the cylinder air induction plugs?

8—What compound or preparation should be applied to the joints of an air starting system in order to render it absolutely air-tight?—H.

1—First of all, we would advise against going to the expense of attempting a repair. It is our opinion that the device could not be repaired to give continued satisfaction. If the magneto is the high-tension type it will create a spark at a very low engine speed. We could not say whether the motor would be turned over by the starter fast enough to fire the engine.

2—Ask the salesman to test the coil for a spark, from dry cells, and watch the test yourself.

3—Not to our knowledge.

4—Spiral-bevel gears would give quieter action. You can obtain the regular gears at a price computed from quantity production. Spiral-bevel gears would require a special job and a very expensive one. The added cost would not pay for the advantage.

5—The greatest load on the connecting rods lies in the force of the gas explosion, not in the weight of the pistons, although, of course, this has a slight effect. The connecting rods are made as light as practical by the factory. Any drilling or removing of stock would bring the rods nearer the breaking limit.

6—An oil radiator should not be necessary on your car. These are advisable only when a motor is subjected to sustained high speed. We do not see how such a cooler could be attached to your car in an advantageous place.

Many readers have written that they were at a loss to know a simple method of adjusting headlights. This illustration and the explanation given should be applicable to any car

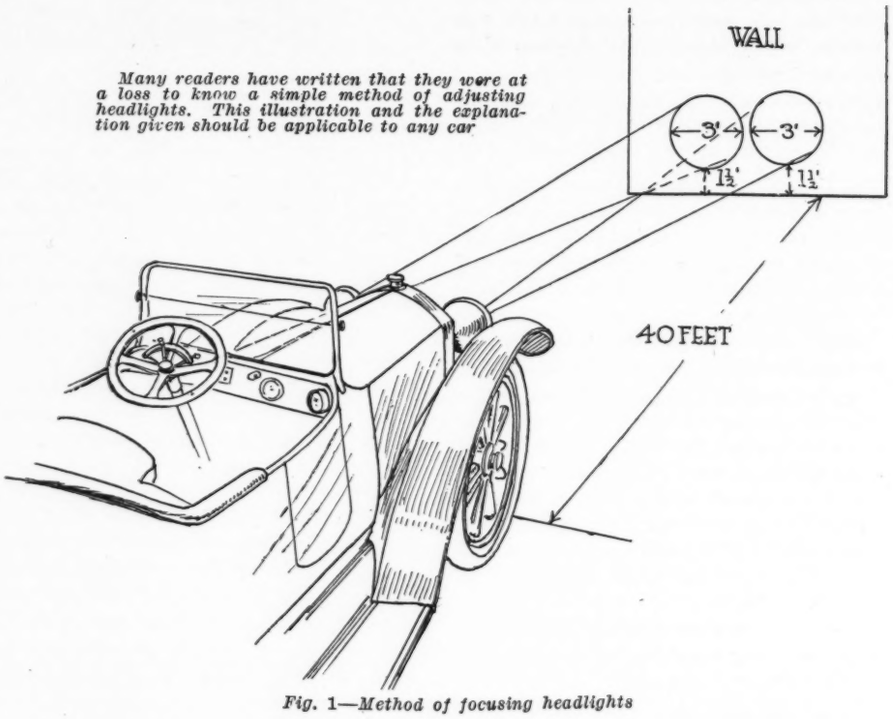


Fig. 1—Method of focusing headlights

7—Yes. The trouble is in the joints.

8—White lead. The trouble lies in keeping the system tight.

HOW TO REPAIR FLANDERS AXLE

Werth Jelden Will Not Have to Buy New Axle, Says Reader

Kansas City, Mo.—Editor Motor Age—Feeding duly thankful for information found in this department and believing one should pass along a good thing to a fellow sufferer, I wish to offer a suggestion to Werth Jelden, Hamilton, Ill., who asks about his trouble with a Flanders 20, and if it would be possible to install some other make of axle. It will not be necessary, probably, if he will follow my advice.

I have one of the original E.M.F. 20s, which I purchased second-hand. Within 90 days I had broken two propellor shafts; shortly afterward the left half of the axle shaft broke. I then determined to find out what was wrong with this axle as all parts looked strong and equal to a great deal more work than they were doing. The first two breaks were repaired in a shop, but the last one I determined to fix myself as I wanted to make sure everything was all right; then, too, I had an idea there might be a weak spot in the differential.

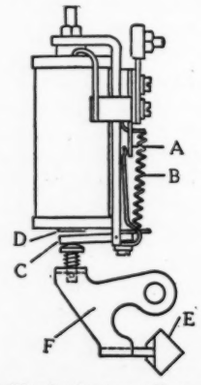


Fig. 2—To illustrate operation of Delco cut-out relay

After replacing the broken axle and washing off all the old grease I discovered two key-ways under the ball bearings, but no keys, and no evidence that keys had ever been in them. That solved the problem. I made keys to fit, as the company who sells parts for this car informed me it had no keys and had never heard of fitting keys in such places.

It will be plain, if you stop to think of the movement of the axle and the ball bearings in this or any other car, that the bearings on the left side have a tendency to back out when they are on a thread as these are, allowing the gears to get out of proper mesh and causing a bad rattle, and all kinds of notions not intended by the manufacturer. The extra vibration soon breaks some part, in my case the two propellor shafts and then the axle shaft.

This difficulty occurred during the fall of 1913, and was repaired as outlined in the early part of February, 1914; since which time not a single cent has been spent

on the car for repairs. I have had the axle apart for other reasons and had an opportunity of seeing how the keys were holding and found everything tight. Have known of several of these machines to go to pieces in the rear axle and I believe the trouble is due to the same cause.

I hope Mr. Jelden will try out this suggestion before going to the expense of a new axle.—Ehner Noyes Williams.

TO SET MARATHON CARBURETER

Cannot Compare Merits of Two Gas Saving Devices

Union, O.—Editor Motor Age—Kindly explain the adjustment of the Marvel carbureter used on the 1914 model W Marathon. Also what causes this carbureter to become loaded when coasting a short distance or going down a small grade, and what causes it to miss a great deal when the car is traveling at high speeds as if the mixture were too lean?

2—What are the dimensions and horsepower of the 1914 model W Marathon motor?

3—Is a well constructed auxiliary air valve, attached to the intake manifold of a motor as good as a steam injecting device considering gain of power and saving of gasoline?—Emerson Binkley.

1—To adjust this carbureter, start the motor and close the throttle so that the motor will turn over as slowly as possible; then adjust the needle valve or spray valve which regulates the flow of gasoline, by turning to the right one notch at a time until the motor shows indications of missing explosions. Then reverse the movement and unscrew the needle valve about two notches. With this adjustment properly made, open the throttle with a quick movement in order to test the adjustment on wide-open throttle. If the motor speeds too slowly it is an indication of too much gasoline. In this event unscrew the auxiliary air-valve adjustment in order to lighten the tension on this valve which will admit more air on open throttle, this being equal to less gasoline. On the other hand, should the motor make a popping noise and threaten to stop, this is an indication of too mu h air; therefore, the tension on the auxiliary air-valve should be increased. Very probably the float valve sticks when you are going down grade due to the angle of the car, this causing the carbureter to load. Your missing is not necessarily due to the carbureter. If, after you have adjusted the mixture according to the directions given above, you still have the missing, you should look to your ignition or valves for the trouble.

2—The motor has a 4.25-inch bore and 4.5-inch stroke. The horsepower according to the N. A. C. C. formula is 28.9.

3—Motor Age knows of no tests which have been conducted from which the relative merits of the two devices could be stated.

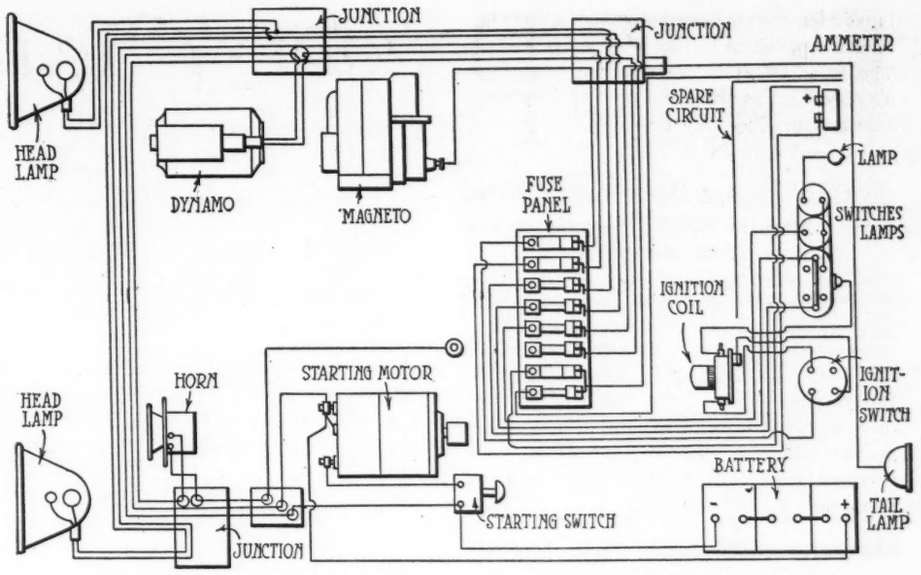


Fig. 3—Diagram of Bijur starting and lighting wiring on Winton

FACTS ABOUT ARMATURE WINDING

Reader Asks Concerning Details of True High-Tension Magneto Construction

Oklahoma City, Okla.—Editor Motor Age—Kindly explain in detail an armature winding of a true high-tension magneto, where the secondary is wound directly in the armature.

2—Where does each end of the armature winding lead to?

3—Does one end go through the breaker contacts to the ground, or where?

4—Where does each end of the secondary winding lead to?—L. S. Alexander.

1—To make the construction clear one sketch showing the system in its utmost diagrammatic simplicity, and the other two to show how the coils are related to the armature core are shown in Fig. 4. LT is the low-tension wiring on the armature core, the wiring being thick with comparatively few turns. HT is the high-tension wire on the same core, which is a thin wire with many turns. A and B are contact points connected to the low-tension, B being carried by a lever which is knocked away by the cam CM. A is insulated from the frame. K is the condenser, joined to the contacts A and B. One end of the low-tension coil is joined to the frame; so also are the lever and one side of the condenser. The frame, therefore, is used to join these together.

The other end of K of LT, and one end of HT are live ends. They are joined together and also to the insulated contact block to which A is fixed. In connection with the second two diagrams, it is assumed that the commutator travels a quarter of a revolution. During most of this movement, voltage is being induced in both the low-tension and high-tension windings by virtue of the change in the magnetic lines through both. This voltage will slowly increase for a while, then rapidly rise to a maximum—the critical position.

But, though the tension in the high-tension coil is much higher than that in the low-tension, current flows only in the latter. The low-tension coil is short-circuited through the contact points and frame, and has, therefore, a complete conducting circuit of low resistance. Contrary to this, the high-tension circuit is open, because of the air-gap at the spark plug, hence the difference in current.

As the maximum position is approached the voltage in the high-tension approaches the sparking value, and there is a strong current flowing in the low-tension coil, and therefore through the contacts A and B. At this moment the cam opens the points in the low-tension circuit, as shown in the last diagram, and as a consequence the low-tension and high-tension coils become one; the voltage acting in the high-tension

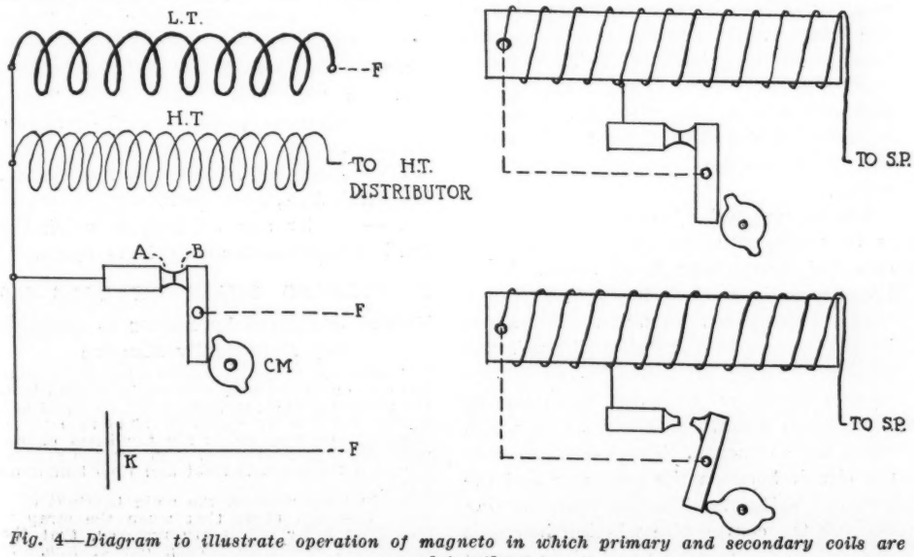


Fig. 4—Diagram to illustrate operation of magneto in which primary and secondary coils are wound together

is suddenly reinforced by the great momentum pressure of the low-tension circuit. The joint effect is to raise the voltage to a very high value and a fine explosion spark is produced at the plug.

2-3-4—Answered in the above.

MAKING BUICK INTO SPEEDSTER

Submit Plans to Nearby Carriage Maker, Is Suggestion

Aurora, Neb.—Editor Motor Age—I am going to rebuild a model 43 Buick into a racing car and would like suggestions for this work. If possible, give me the name of a concern who could build me a body.—William J. Farley.

We are illustrating in Fig. 6, an idea for reconstructing your model 43 Buick into a speedster. The best plan would probably be to submit your ideas to a carriage maker in your vicinity and let him build a body for you.

READER CRITICIZES CAR DESIGN

Reader Thinks Manufacturers Do Not Give Location Enough Thought

Phoenix, Ariz.—Editor Motor Age—If designers of motor cars kept the ordinary tourist, and not the well-equipped garage or factory, in mind, it would be much easier to make small repairs. On some of the very best cars there are nuts that can scarcely be reached without taking the engine from its bed. The heads of bolts are placed in a position that cannot be reached when they turn, and nine out of ten will turn when you put a wrench on the nut. I don't know what I should do with these nuts if I set out to build a car, but I am not a builder or designer. I can only state my conviction that the designers have not done the best they could to make cars simple and easy to repair.

Then there are screws and screw-bolts with slots in the head so shallow that no screw-driver of any size can be used when the threads get rusty or set. No matter how much care he exercises, any motorist is liable to tear the head of a screw to pieces and make it almost impossible to get the thing out.

It appears to the common man that by this time something better than the ordinary hose connection could have been invented. The most modern motors have hose connections as crude, as likely to come unfastened, as those that connected the first radiator with the first water-jacket. The clamps are primitive and hard to tighten. More than once I have thrown away my clamps and fastened the connection with steel wire, which anyone can handle with a pair of pliers.

Any strain or twist is liable to start the hose leaking at the joints. If the hose is an old one a leak may be started through the fabric and rubber. A connection went to pieces on me once, ten miles from a garage. I made a new one with a piece of old tube, which served the purpose admirably and was not even scorched when taken off. This is a good tip for any driver to remember.

It is also a good thing to remember to put a few pieces of baling wire—we call it Mormon silk out west—in the toolbox. It is surprising how many things can be done with it. For emergency repairs it is invaluable.

Carry two jacks so that you can get your axle off the ground in case you lose a wheel. Learn all about your car that you can and make your own repairs whenever possible. If you do have to go to a garageman whom you don't know to be all right, don't shut your eyes and trust in God, but hang around and see that he doesn't put distilled water in the commutator, or drop your spare plugs into the differential.—Ernest Douglas.

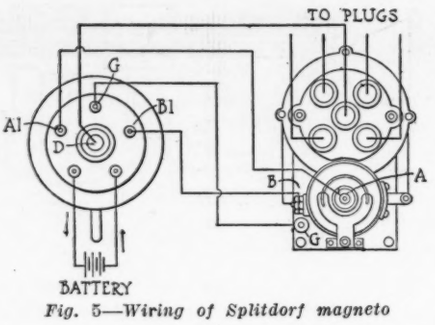


Fig. 5—Wiring of Splitdorf magneto

BATTERY CHARGING IN DELCO

Provision Made by Cutout Relay to Keep Load Uniform

Victoria, B. C.—Editor Motor Age—Kindly tell me what form of regulation is provided to prevent the battery from becoming overcharged on the Delco system, as applied to the Hudson 6-40, 1914 model.

2—What different ratio is there between the second and high gear on the Cadillac eight?

3—Kindly give a wiring diagram of the 1916 Winton Six, models 33 and 48.—Victorian.

The operation is performed by a cut-out relay, Fig. 2. The instrument performs a double function; in the initial starting operation it is closed mechanically to complete the current between the storage battery and the generator armature; it also automatically closes the circuit between the storage battery and the generator, when the generator voltage is high enough to charge the storage battery. It opens the circuit when the generator slows down and the voltage becomes less than that of the battery, thus preventing the latter from discharging back through the generator. The cutout relay is an electro-magnet with a compound winding. The voltage coil, or fine wire winding, is connected directly across the terminals of the generator.

The current coil, of coarse wire winding, is in series with the circuit opened and closed at the contacts A, see figure. When the engine is started, the generator voltage builds up and when it reaches about 7 volts, a current passing through the voltage winding produces enough magnetism to overcome the spring B, attracting the magnet armature C to core D, which closes the contact A. These contacts close the circuit between the generator and the storage battery. The current flowing through the coarse wire winding increases the pull on the armature and gives a good contact of low resistance at the contact points. When the generator slows down and its voltage drops below that of the storage battery, the battery sends a reverse current through the coarse wire windings, which overcomes and stops the pull on the magnet armature C. The spring B then opens the circuit between the generator and the battery, and will hold it open until the generator is again started up.

2—The high gear ratio is 4.5 to 1 and the second gear ratio 7.79 to 1.

3—The Winton wiring diagram is shown in Fig. 3.

TIMING VALVES AND IGNITION

Method of Setting Cams and Spark on 1912 Marathon

New Windsor, Ill.—Editor Motor Age—Kindly give information as to the complete timing of the 1912 Model L 30 Marathon motor.

2—Where can one secure a copy of the A. A. A. racing rules?

3—Under what rules are races not sanctioned by the A. A. A. run?—R. W. Douglas.

1—You should find on the flywheel of the motor marks which indicate where the flywheel should be located when the inlet valve of No. 1 cylinder just starts to open. Set this mark at the exact top of the flywheel and mesh the gears so that the eccentric of the cam which lifts the intake valve in No. 1 cylinder is in such a position that any further turn of the flywheel will start to open the valve. If the marks are not visible a very good setting can be obtained by setting the piston of No. 1 cylinder, the cylinder nearest the radiator, at $\frac{1}{16}$ inch below top center. To do this set the motor with No. 1 piston at the top of its stroke. Then with a rule applied to the top of the piston, turn the motor over until the piston has dropped $\frac{1}{16}$ inch. With the piston in this position the camshaft gears should be set to open the intake valve as described above.

With the motor in the same position, that is with the piston $\frac{1}{16}$ inch below top center, the magneto should be timed so that No. 1 points are just ready to break. The spark should be fully retarded in making this adjustment. This should give a very fair adjustment. If it is your opinion that the spark is too early or too late you can very easily change the timing by changing the position of the magneto coupling.

2 — American Automobile Association, 437 Fifth Ave., New York.

3 — Under any rules upon which the track management and drivers agree.

TIGHTENING CHAIN ON COLE 850

Method Suggested by Reader Is Satisfactory if Carefully Handled

Alexandria, Minn.—Editor Motor Age—I have a Cole model 850. The chain which drives the generator and fan has become loose. I had a new one put in and now it is also worn. Would it be possible to file the holes of the generator bolts, upwards, then lift the generator until the chain is tight and then bolt it up tight?

2—In tightening up the main bearings of a car. I should think that when the strap is bolted on after shims are removed, that the crankshaft would be sprung out of line. Is this so, and is there any way to overcome it?

3—The timing on this car once slipped and advanced itself so far that the engine would not run. The mechanics at a service station fixed it, but they didn't know what they did. They just took the distributor apart and put it together again. How could this slip, and why?—Subscriber.

1—The chain can be adjusted in this manner. Great care must be taken in filing both slots an equal distance upward or at least being sure that the generator is moved upward equally on both sides. Otherwise a misalignment would be created with the result that the shaft would shear off.

2—Removal of shims does not change the alignment. The shaft presses against the top of the bearing in the same place with the strap loose or tightened by removing shims.

3—It is hard to tell what caused this unless the fan and generator-shaft chain became so loose that it jumped over one of the sprocket teeth.

OVER-OILING IN AN EIGHT MOTOR

Take Car to the Dealer From Whom You Purchased It

Chester, Mont.—Editor Motor Age—I have a 1916 model 348, eight-cylinder Jackson which throws too much oil up in the left block of the motor when running 25 miles per hour or more. Kindly explain how this may be stopped. This motor has a pump feed. I have turned the adjusting screw to the right, which is the right way to shut off the pump for less oil, all that is possible, but still it throws too much oil up in the left block when the motor is running better than 20 or 25 miles. This is the same side of the motor that the oil pump is on. The adjusting screw on the pump pushes against a spring in the pump. Would it help if a stiffer spring was put in. It seems to be all right when the car is running slow, but as soon as it is speeded up it throws oil up on the side and fills the spark plugs, and of course they stop firing. The other block of the motor seems to be all right, at least I have had no trouble with the spark plugs on that side.

2—The motor has also developed a knock which I cannot locate, the same is also heard plainly only when the motor is speeded up, even when the spark plugs have just been cleaned and adjusted and put back in. When the motor is started up slowly, the knock cannot be heard, but seems to pound and knock when it is speeded up. This motor has been run about 1,000 miles. The oil gauge has always been about three-quarters full.—C. P. Logan.

1-2—According to the factory you are using too light a grade of oil in your motor, this providing that the circumstances are just as you outline. It is also possible that the piston heads need reboring. It is the advice of the manufacturers that you put your car in the hands of the dealer who sold it to you or write to the factory direct.

Gas Adjustment on Patterson

Bucyrus, O.—Editor Motor Age—Kindly give complete information regarding the adjusting of a Stromberg carbureter as used on the Patterson 6-42, 1916 model. I wish an adjustment that will give me most power with an economical use of gas.—F. C. Myers.

See answer to Harry E. Ellett's communication on these pages. The carbureter adjustments are performed in the same manner.

Short Circuit in Delco System

Springview, Neb.—Editor Motor Age—I have a 1914 Cadillac fitted with the Delco system. When the switch is on M there is a spark in one of the wires leading to the dry batteries when striking it to the frame of the car. It does this whether the engine is running or not, if connected to dry batteries, and it kills them in a very short time. Kindly tell me where I would be able to find the short.—Springview Garage.

The manufacturers of the equipment suggest that you write them direct. Address your letter to the service department of the Dayton Engineering Laboratories Co., Dayton, O. In your letter explain at length just what your troubles are.

Focusing Car Headlight

Central City, Ia.—Editor Motor Age—Will you please tell the correct method of focusing the headlights on a car? I seem to have lost the issue of Motor Age having this in.—D. B. Woodridge.

The method given below is about as simple as any, although there are many ways in which the job can be done. Refer to Fig. 1. Locate the car 40 feet from a wall, preferably white. Best results, of course, will follow if the adjusting is done at night. Throw the lights on to this wall and adjust them so that the circle of light from each lamp will be close to 3 feet in diameter, and the edges of these circles will nearly touch as shown. There should be a distance of about 1½ feet from the ground to the lowest point of each circle.

Inquiries Received and Communications Answered

H.....Austin, Tex.
E. N. Williams.....Kansas City, Mo.
L. S. Alexander....Oklahoma City, Okla.
William J. Farley.....Aurora, Neb.
Ernest Douglas.....Phoenix, Ariz.
Victorian.....Victoria, B. C.
R. W. Douglas.....New Windsor, Ill.
Subscriber.....Alexandria, Minn.
C. P. Logan.....Chester, Mont.
Haney-Gasper-White Co..Algoma, Mont.
W. N. McLeod.....Garnet, Mich.
Russell Wells.....Franklin, Minn.
D. B. Woodridge.....Temple City, Ia.
S. H. S.....Jefferson City, Mo.
T. G. Saunders.....Killdeer, N. D.
F. C. Myers.....Bucyrus, O.
Springview Garage....Springview, Neb.

No communications not signed by the inquirer's full name and address will be answered in this department.

Wiring of Low Tension Splitdorf

Garnet, Mich—Editor Motor Age—Kindly publish a diagram showing how to wire a Splitdorf low-tension magneto and dry cells with one set of spark plugs. This is on a Velie model D, and uses eight spark plugs, and we wish to try it so as to do away with four of these plugs.—W. N. McLeod.

A Splitdorf magneto system wired with a battery is shown in Fig. 5.

Remagnetizing Ford Magnets

Franklin, Minn.—Editor Motor Age—Could you give me any information in regard to remagnetizing a Ford magneto? I have been using an 18-volt battery in connection with a Ford magneto remagnetizer. I have a Hoyt tester. I find that I can make but very little gain with the magnetizer I have.—Russell Wells.

Information on remagnetizing Ford magnetos will be found in the August 17 issue of Motor Age, page 47.

Connecting Owl Light

Killdeer, N. D.—Editor Motor Age—I have recently purchased an Owl searchlight which has a two-point contact. How can one connect this on a model 32 Hupmobile which is equipped with a Westinghouse electric starting and lighting system?—T. G. Saunders.

Connect a wire with any of the light terminals on the lighting switch to one point of the search light. Run the other wire to the frame of the car.

Can't Charge Battery from Ford Magneto

Jefferson City, Mo.—Editor Motor Age—Can a Ford magneto be used for charging a 6-volt Willard storage battery? The magneto never is in use, as I use the Atwater Kent system.

2—Also, can a 6-volt motor-driven Stewart horn be operated from the magneto?—S. H. S.

1—No.

2—Yes.

How to Make Electro Magnet

Algoma, Wis.—Editor Motor Age—I wish to make an electro-magnet for magneto magnet recharging. What size wire should I use, and how much? What should be the size of the pole pieces?—Haney-Gasper-White Co.

Information which will answer your questions will be found in the Repair Shop page of this issue.

HAS LEAKLESS PISTON RING IDEA

Market Depends Entirely Upon Merit of Product in Question

Temple, Tex.—Editor Motor Age—I have a non-leaking piston ring idea and I would like to know whether or not it can be marketed. Could Motor Age give me a description or sketches of all the different piston rings that have been patented? Can Motor Age advise me whether the ring should be patented and name a reliable patent office, and also please tell me if you can what and where a market is that would be interested in the ring?—Charles Rasener.

Piston ring designs are so many and varied that space does not permit giving a representative selection of types. Motor Age cannot advise you whether the ring should be patented. If, in your opinion, it has enough merits to compete with the other rings on the market, considering cost of manufacture, wearing qualities and non-leaking qualities, then it surely is worth patenting. You can find the names of reliable patent offices in the advertising sections of Motor Age. If your product is, in the opinion of manufacturers, better than any other, you will have no trouble finding a market. Submit samples to motor manufacturers for their inspection.

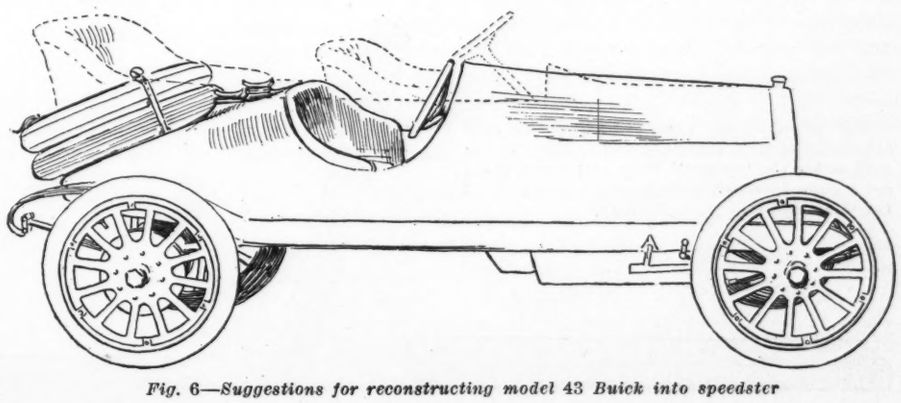
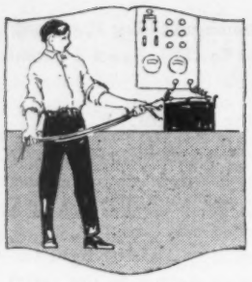
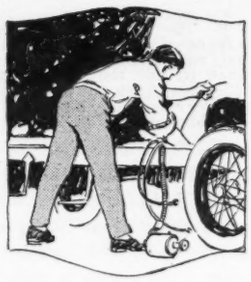


Fig. 6—Suggestions for reconstructing model 43 Buick into speedster



Electrical Equipment of the Motor Car



By David Penn Moreton & Darwin S. Hatch.

Editor's Note—Herewith is presented the ninth installment of a weekly series of articles which began in Motor Age, issue of June 29, designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the Class Journal Co., Chicago, in a size to fit the pocket conveniently.

WHAT HAS GONE BEFORE

The fundamentals of electrical circuits of the motor car were explained through their analogy to water systems and the relations of current pressure and resistance brought out. This was followed by an explanation of series and multiple circuits and how electricity is made to do work in lighting, starting, signalling, etc. Calculating the capacity of a battery for starting and lighting and the cost of charging storage batteries and determining the torque a starting motor must develop were explained. Action of primary batteries and dry cells were taken up and the best methods of connecting them. A separate section was devoted to the makeup and action of lead and Edison storage batteries, and another to the care of lead batteries in service and best methods of charging them.

Part IX—Magnets and Magnetism

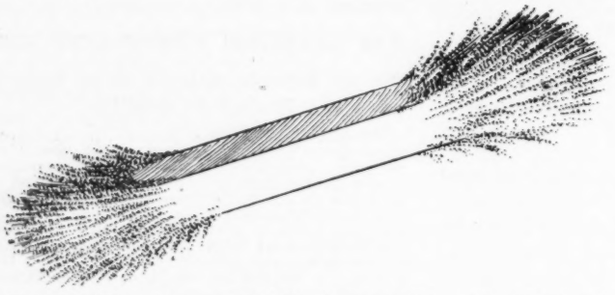


Fig. 67—When a magnet is dipped in iron filings, the filings will cling to the ends of the magnets, which are called poles

THE name *magnet* was given by the ancients to certain black stones found in various parts of the world, principally at Magnesia in Asia Minor, which possessed the property of attracting small pieces of iron and steel. Later, the Chinese discovered that if a piece of this black stone were freely suspended by a string it possessed the very remarkable property of pointing always in the same direction, nearly north and south; thence they called the stone "lodestone," or "leading stone," and used it in this manner to assist them in navigating their ships. The natural magnet, or lodestone, is an ore of iron and is called magnetite.

Artificial Magnet

If a piece of iron, or, better still, a piece of hard steel, be rubbed with a lodestone, it will be found to possess the properties or characteristics of the natural magnet; that is, it will attract light pieces of iron; it will point approximately north and south if freely suspended by means of a piece of string; and it can be used to magnetize other pieces of iron or steel. Magnets made in this manner are called artificial magnets.

Strong artificial magnets, however, are not made by using the lodestone, as it is impossible to make them strong enough by this method, but by methods described in a following section on electromagnetism.

Poles of a Magnet

Certain parts of a magnet possess the property of attracting iron and steel to a greater extent than do other parts, and these parts are called the *poles* of the magnet. The poles of a bar magnet are usually situated at or near the ends of the bar, as shown in Fig. 67, which shows a bar magnet that has been dipped into iron filings; the filings are attracted and adhere in tufts at the ends.

When a magnet is supported on a sharp pivot or suspended by a light thread, it adjusts itself to such a position that it points nearly north and south. A small elongated magnet thus suspended is called a magnetic needle. If such a needle be turned from the position which it naturally takes and is free to swing, it will at once return, swinging to and fro until it settles down in its original position. This tendency of the magnetic needle to set itself approximately north and south is the foundation of the compass.

The end of the needle which points approximately toward the north geographical pole is called the *north* pole, and is usually marked with the letter N; while the other end of the needle is called the *south* pole.

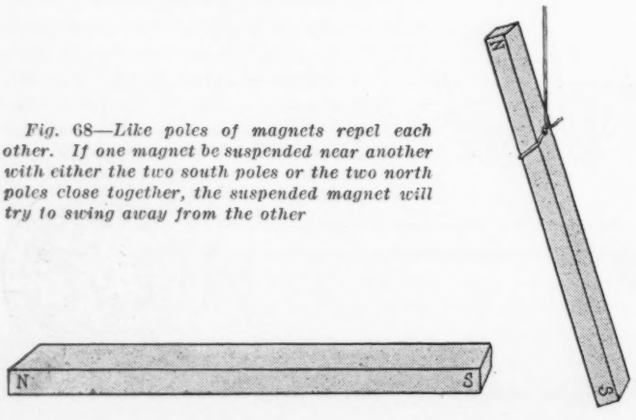


Fig. 68—Like poles of magnets repel each other. If one magnet be suspended near another with either the two south poles or the two north poles close together, the suspended magnet will try to swing away from the other

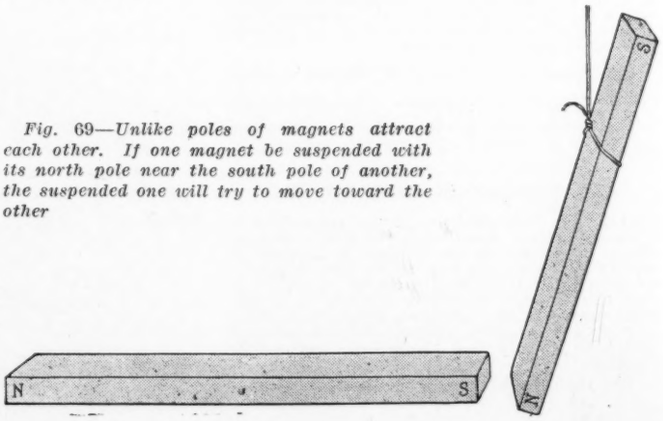


Fig. 69—Unlike poles of magnets attract each other. If one magnet be suspended with its north pole near the south pole of another, the suspended one will try to move toward the other

The north pole of a magnet is often called the positive or plus (+) pole, and the south pole is often called the negative or minus (—) pole. Since the north or positive pole turns toward the north, it is sometimes called the *north-seeking* pole, and the south or negative pole is sometimes called the *south-seeking* pole.

If a pole of a magnet is brought near a magnetic needle, it is found to attract one pole of the needle and repel the other pole. The north pole of the magnet may be determined by observing the position it takes when suspended by a thread and it will be found that the north pole of the magnet always repels the north pole of the needle and always attracts the south pole of the needle. Similarly, it will be found that the south pole of the magnet always repels the south pole of the needle and always attracts the north pole of the needle.

This action shows that there are two kinds of magnetic poles, and that poles of the same kind repel each other and poles of opposite kinds attract each other. The action between two like magnetic poles is shown in Fig. 68, and the action between two unlike magnetic poles is shown in Fig. 69.

Induced Magnetism

If a bar of soft iron be used instead of a magnet, it will be found that either end of the bar of soft iron will attract either pole of the needle. If one end of the iron bar be thrust into a quantity of fine iron filings and withdrawn, only a very few of the filings will adhere to the end of the bar. If, however, one end of the bar be thrust in a quantity of filings and one pole of a permanent magnet be presented to the other end of the bar and the combination then withdrawn, a large number of the filings will adhere to the end of the soft iron bar, as shown in Fig. 70. Practically all of the filings will fall from the end of the soft iron bar if the permanent magnet be removed from the other end. The action between the soft iron bar and the compass needle will increase with a decrease in the distance between them. Similarly, the ability of the soft iron bar to hold the filings will increase as the distance between it and the pole of the permanent magnet decreases. In either case, the bar of soft iron becomes *magnetized* due to the action of the compass needle or the permanent magnet, and two magnetic poles are produced on it. The end of the bar nearest the magnetic pole on the compass needle, or permanent magnet, will be of opposite sign, while the end of the bar farther away from the compass needle, or permanent magnet, is of the same sign as the pole on the compass needle, or permanent magnet. Magnetism produced in this manner is called *induced magnetism.*

The magnetism induced in a piece of iron may induce magnetism in another piece, and this in another piece, and so on; and thus a magnet may be made to support similar pieces of iron end to end as shown in Fig. 71, each of which has become a magnet by induction. The magnetism of each sucessive piece is weaker than in the preceding piece.

Magnets are made to assume many different forms, depending in a great measure upon their application. The two principal forms, however, are known as bar and horseshoe magnets, respectively. A bar magnet is shown in Fig. 67 and a common type of horseshoe magnet, as used in the construction of magnetos, is shown in Fig. 72.

A material in which magnetism may be induced, and which is therefore attracted by a magnet, is called a magnetic material. Iron

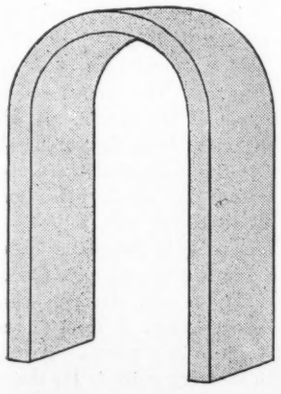


Fig. 72—A horseshoe magnet such as is commonly used in the ordinary magneto for ignition. It is simply a bar magnet of inverted U shape

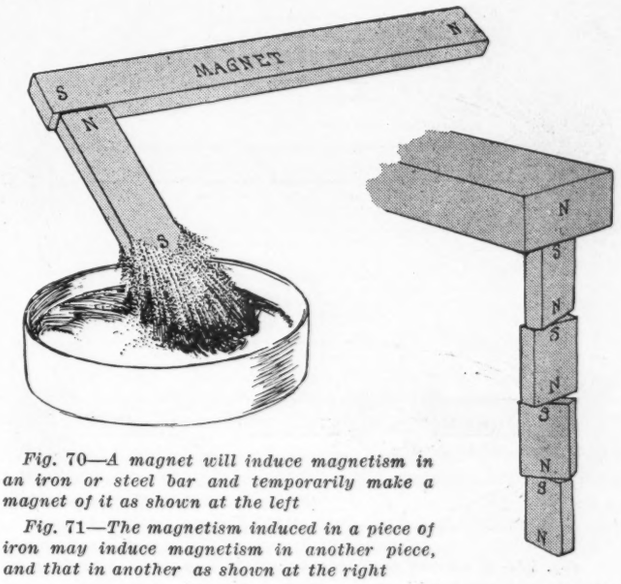


Fig. 70—A magnet will induce magnetism in an iron or steel bar and temporarily make a magnet of it as shown at the left

Fig. 71—The magnetism induced in a piece of iron may induce magnetism in another piece, and that in another as shown at the right

in its various forms, such as wrought iron, cast iron and steel, is the best magnetic material known. There are a few other materials, such as cobalt, nickel and chromium, that are slightly magnetic but very much less than iron. All materials which are not quite strongly magnetic are usually spoken of as non-magnetic materials, since they are nearly neutral as regards magnetism. Unfortunately there is no insulator for magnetism as there is for electricity.

Demagnetization

Continuous jarring of a magnet will tend to cause its magnetism to disappear, or to demagnetize it. If a magnet be heated to a temperature about red heat, it becomes demagnetized, and the iron at the same time loses its magnetic quality and does not regain it until it cools to a lower temperature. Since a magnet tends to lose its magnetism so readily, it is customary to furnish the horseshoe form with what is called a keeper. The keeper is a piece of iron which may be placed across the poles of the magnet, which makes a complete magnetic circuit and thus tends to prevent the demagnetization of the magnet by jarring.

Coercive Force

Some materials are more readily magnetized and demagnetized than others. For example, it is well known that soft iron is very readily magnetized, but loses practically all of its magnetism if it is slightly jarred after it is removed from the influence of the magnetizing force. Hard steel is usually more difficult to magnetize, but it, on the other hand, does not lose its magnetism so early as soft iron. In general the harder the steel, the harder it is to magnetize and the more strongly it retains its magnetism. The property of a magnetic material which opposes its demagnetization is called its *coercive* force, and it is desirable to have a material of high coercive force in making strong permanent magnets.

When a magnet is magnetized as strongly as possible, it is said to be *saturated,* and if the magnetizing force producing the magnetism be removed, the magnet will immediately grow weaker and it will continue to get weaker for a considerable period until the magnetism finally becomes permanent in strength. Magnets which have lost the temporary magnetism due to saturation are called aged magnets and they should always be used where it is desired to have a constant magnetic effect. The ability of a magnetic material to retain its magnetism after being magnetized is called its retentiveness.

Molecular Theory of Magnetism

There are quite a number of experimental facts which lead to the conclusion that magnetism has something to do with the molecules of the substance, since any disturbance of the molecules causes a change in the degree of magnetization. If a glass tube full of hard steel filings be magnetized, it will behave toward a compass needle or other magnet as though it were a solid bar magnet, but it will lose practically all of its magnetism as soon as the filings are

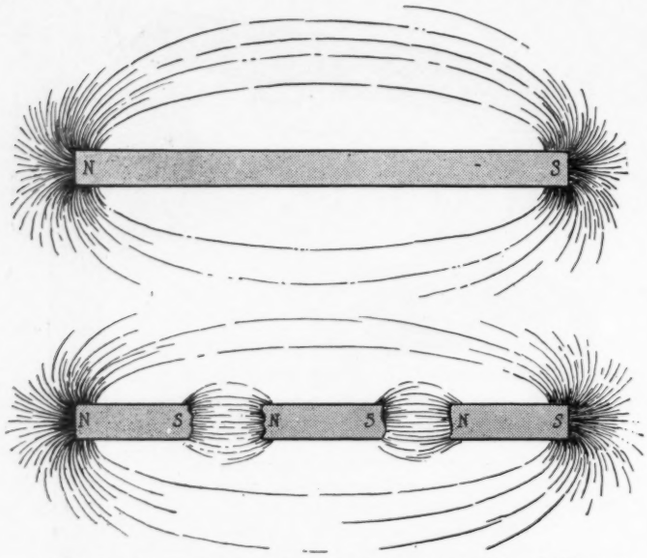


Fig. 73—A magnet may be broken into any number of different pieces and there will appear in each piece a north and a south pole

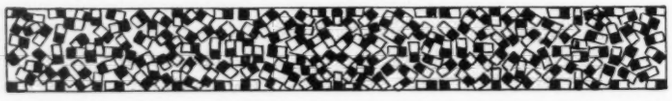


Fig. 74—Assumed arrangement of molecules of iron in an unmagnetized bar

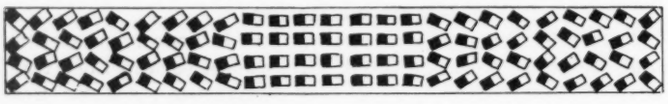


Fig. 75—Rearrangement of molecules in an iron bar, assumed to take place upon magnetization. Each molecule becomes a tiny magnet and all have their north poles pointing approximately one way

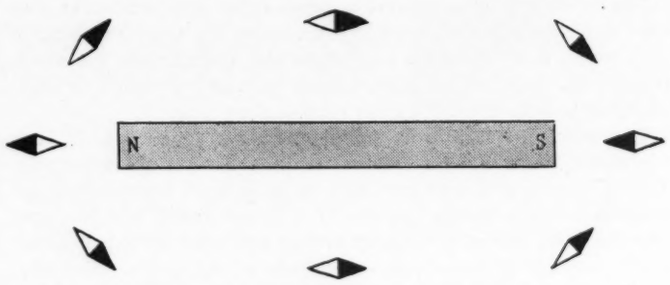


Fig. 76—Direction of magnetic field about a magnet as indicated by a compass

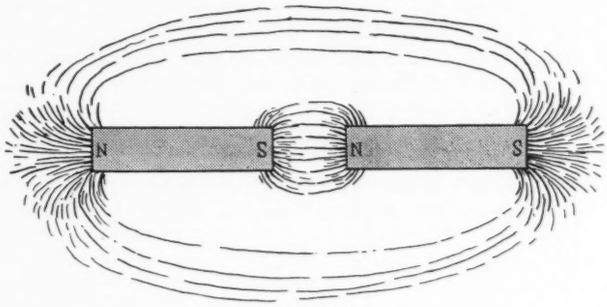


Fig. 77—Lines of force pass from the north pole of one magnet to the south pole of another, when N and S poles are adjacent

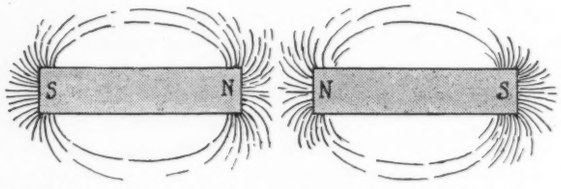


Fig. 78—Lines of force pass between N and S poles of each magnet when N poles are together

rearranged with respect to each other by giving the glass tube several good shakes. A magnet will lose its magnetism when heated. A magnet may be broken into any number of different pieces and there will appear at each break a north and south pole as shown in Fig. 73. The strength of any magnet will be greatly reduced by hammering, twisting, or bending it.

A theory often used to explain the above facts is as follows: In an unmagnetized bar it is assumed that the molecules are each a tiny magnet and that these molecules, or magnets, are arranged in no definite way, except that the poles of the different magnets neutralize each other throughout the bar. The supposed arrangement of the molecules in an unmagnetized bar is shown in Fig. 74.

When the unmagnetized bar is brought under the influence of a magnetizing force, the tiny magnets are turned, due to the action of the outside magnetizing force, so that their north poles tend to point in one general direction and their south poles tend to point in the opposite direction. The supposed arrangement of the molecules in a magnetized bar is shown in Fig. 75. The opposite poles neutralize each other in the center of the bar but there will be a north pole found at one end and a south pole at the other.

The ease with which any material may be magnetized as compared to some other material will depend upon what might be termed the molecular friction of the material. Thus, the molecules in a bar of steel offer a greater resistance to a change in their position than do the molecules in cast iron. Steel, as a result, is harder to magnetize than cast iron, and it will also retain its magnetism after once magnetized better than cast iron for the same reason.

Some unit of measure must be employed in order to be able to express the strength of a magnet, and for this reason we have what is called a unit magnetic pole. A magnetic pole is said to have a strength of 1 when it will repel a magnetic pole of equal strength and of the same kind with a force of 1 dyne when they are one centimeter apart. There are 2.54 centimeters in 1 inch, and 444,823 dynes in 1 pound, so that the force between two unit poles is very small. In the above definition the magnetic poles are supposed to be concentrated at points. The force acting between two poles will increase with an increase in the value of the product of their respective strengths and decrease as the square of the distance between them.

Magnetic Field

Any open space in which there will be a magnetic force acting on a magnetic material, if it be introduced in the space, is called a magnetic field. Every magnetic field possesses two properties which must be known in order that a magnetic field may be described. These two properties are the direction of the magnetic field and the strength of the magnetic field.

The direction of a magnetic field is defined as being the direction in which a north magnetic pole would be urged if it were placed in the magnetic field. Since a north magnetic pole cannot be separated from its equal south pole, the direction of the magnetic field may be determined by observing the direction in which the north pole of a short compass needle will point when it is placed in the magnetic field at the point where the direction of the field is desired. For example, the direction of the magnetic field surrounding a bar magnet may be determined as indicated in Fig. 76. The shaded end of the compass needle indicates the north pole of the needle. It will be observed that the direction of the field is out from the north pole of the magnet at one end; it is parallel to the magnet at the center of the magnet and from the north toward the south pole; and toward the south pole of the magnet at the other end.

The strength of a magnetic field at any point is defined as being equal to the force in dynes acting upon a unit magnetic pole placed at the point in question. A magnetic field has unit strength when it exerts a force of one dyne on a unit magnetic pole. A force of one dyne is very small, as there are 444,823 dynes in 1 pound. A uniform magnetic field is one whose strength at every point is the same.

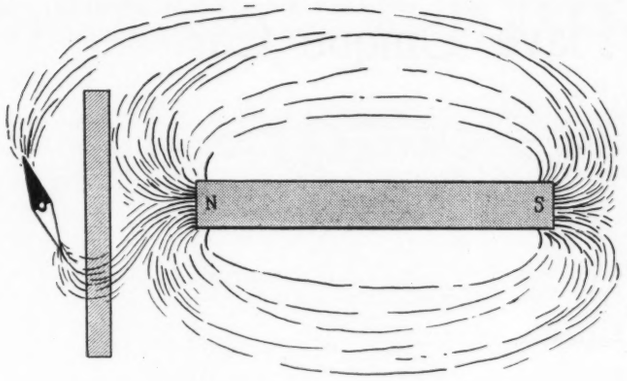


Fig. 79—A piece of non-magnetic material does not change the effect of a magnet

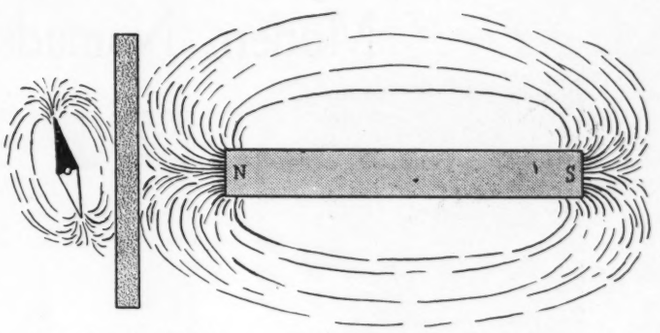


Fig. 80—A piece of magnetic material prevents the lines of force from the magnet from spreading out

For convenience, a magnetic field is imagined as being a space more or less filled with imaginary lines called *lines of force*. The strength of the magnetic field may be represented by drawing the proper number of these lines of force per square centimeter, the area being taken perpendicular to the direction of the field; and the positive direction of the lines is taken to correspond to the direction of the magnetic field.

These magnetic lines of force which are supposed to constitute a magnetic field are supposed to possess two properties. They always tend to shorten themselves and they repel each other, which in a measure accounts for the attraction between unlike magnetic poles and a repulsion between like magnetic poles. Thus in Fig. 77 the lines of force pass from the north pole of one magnet across the intervening space and enter the south pole of an adjacent magnet. Any tendency of these lines to shorten will result in a force tending to draw the poles together, and any force tending to separate the lines themselves will result in a force tending to draw the two poles together. The action between like poles is shown in Fig. 78.

Magnetic Screen

The effect of a magnet upon a compass needle may be varied by introducing a sheet of magnetic material between the two. The sheet of magnetic material acts as a magnetic screen and prevents the lines of force from the magnet spreading out to the extent they would if no screen were used. Introducing a non-magnetic material, such as glass, between the magnet and compass needle does not interfere with the action of the magnet on the compass needle. The effect of the magnetic and non-magnetic material is shown in Figs. 79 and 80.

NEXT WEEK—Part X of this series will explain the production and effect of Electromagnetism and Electromagnets

Mass. Has White Bridges—Requires Lights at Night

Laws of State Accord with Recent Motor Age Editorials

THAT other States could profit very much by following the ideas of Massachusetts through its highway Commission is very evident when one considers how it masters problems that have come up in connection with motoring, particularly with a view of trying to make the highways safer. Recently Motor Age has had articles and editorials on three topics, lights on all vehicles at night; trans-continental record runs; and painting highway bridges white.

Some years ago Massachusetts passed a law requiring all vehicles on the roads to have lights at night. This year the law was amended so that every vehicle must carry a light half an hour after sunset to half an hour before sunrise. Before this year the law said half an hour for motor vehicles and an hour for horse-drawn, so it has been made uniform.

Years ago when the Highway Commission began to build roads and bridges it decided to paint its bridges and fences white in the interest of safety. So now wherever one travels in the Bay State the white fences and bridges denotes one is on the State highway. It has been a great factor for safety.

The Highway Commission also decided that speed events in Massachusetts were not to be tolerated on the state highways. So last year when one of the big concerns held a run throughout the country and 1,000 miles were to be covered in 3 days, the car that started from Boston whirled around at a fast clip, and its goings were chronicled in the papers. It was prima facie evidence of speed. When the contest ended the Highway Commission sent for the Boston dealer and the drivers of the cars. After hearing all the evidence the registration of the dealer to do business was suspended for a week so he had to close up his place of business, practically, for that period.

The Highway Commission issued a statement about it warning others not to attempt any such feats in Massachusetts or drastic measures would follow.

ST. LOUISANS' NOVEL SHOW STUNT

St. Louis, Mo., Aug. 21—St. Louis dealers have a novel plan in connection with the fall show to be held the first week in October. There is to be a parade of all the 1917 models, each dealer being allowed one car in the parade. This will move along Locust street, St. Louis' motor row, and thence to the Maxwelton fair grounds, where the cars will be parked until sundown.

The fall exhibit will supplant the annual show and come at the time of the Veiled Prophet's week, the regular show dates being in February.

U. S. COMMANDEERS OUTPUTS

Washington, D. C., Aug. 19—Foreign buyers of American trucks are now meeting competition in the form of no less a person than Uncle Sam himself. Under the new preparedness measures recently enacted by Congress, the government, in time of need, may require manufacturers of government supplies to stop production for other customers and concentrate on the filling of government orders on pain of having their plants taken over by government officers for operation as required.

This law was put into effect for the first time on the occasion of the recent purchase of trucks for the Mexican border, when such factories as the Four Wheel Drive Auto Co., Clintonville, Wis; the Packard Motor Car Co., Detroit; the White Co. in Cleveland, and various others, were obliged to cease work on European war orders long enough to complete the contracts awarded by the quartermaster department of the U. S. army for 1½-ton and 3-ton trucks.

Modern Nomads Have Unique Car

Front view of the Robins' car

Side view of the car the Adventurers will use

Have Home and Will Live in It Indefinitely—Printing Business Makes Expenses

WE HAVE with us today a combined housekeeping suite and business establishment—and all within a motor car. This outfit is owned and operated by Mr. and Mrs. A. W. Robins, formerly of San Francisco, Cal., but now of anywhere. They have no destination in particular, although they hope some day during their travels to land in New York, which city, however, will be simply a stopping place, after which they will wander again, just as they have been doing since May 18, when they started from San Francisco.

Tired of Paying Rent

"There are several reasons for making this trip," the Robins inform us. "In the first place we were thoroughly tired of paying an exorbitant rent in San Francisco for a place in which to carry on our printing business. When the landlord raised our rent above the $100 a month mark we kicked, and now we are on the road, are our own landlords and work only when the spirit moves. Then, too, we are making the trip, in order that we might improve our health and increase our knowledge and also that we might prove that an undertaking of this kind in a motor car is a possibility."

As this story is being written the Robins family had completed a journey of more than 600 miles down the Pacific coast and so far had found that everything had worked out O. K. Thus far they had cleared all expenses and had a little extra change to tuck away in the family bank. Mr. Robins tells us that they are not going to confine their trip to 1 or 2 years' duration, but that this novel method of travel has been adopted as a regular thing, and it is his expectation that years hence the outfit will be moving about the country.

For this unusual travel undertaking the proprietors have equipped themselves with a very novel car. It is a veritable palace on wheels, There are few comforts of home that are not enjoyed by these people. For instance, there is running water, which runs from a tank which is sufficiently high to give good pressure, a compact Pest-O-Lite gas plant for lighting and cooking, an emergency electric outfit for lighting the car both inside and out, etc. Built-in features — they have them all. There is a built-in bookcase or library, ice chest, medicine chest, cupboard, storeroom, kitchen cabinet, bed, table, etc., and everything being so arranged that when traveling or, in fact, at any other time, all of these features, being weatherproof, may be closed so that they positively exclude all dust or other disagreeable features. There are folding chairs of the very latest design, standard toilet, cabinet grand Victrola, etc., in fact everything that would add to the convenience and pleasure of the travelers.

The car is constructed on the same lines as is the standard Pullman, having eleven sash or drop windows, all of which are screened. Each window has its own shade and silk curtain. The interior of this palace is finished a light coffee color, while the exterior is a dark green, striped in white.

As Mr. Robins is a printer by trade and as it is his intention to earn his livelihood en route, it is necessary for him to carry along his own printing outfit. This consists of a light 6 by 9 press, which is located at the extreme rear of the machine, beside which is the type cabinet containing satisfactory type for all general purposes. Mr. Robins' plan, upon entering a city, is to solicit work among the business men of the place, fill the orders as rapidly as possible, collect his money on the spot, and ramble on his way.

Carry Home and Business

The real point of interest in the Robins' trip is in the means of transportation. So far as is known they are the first to undertake to carry the home—and the business—along, and that they are making good and are enthusiastic over the prospects a 5-minutes' conversation with them will show. Their machine is equipped with a Ford chassis with a Ralston truck attachment, the entire outfit weighing about 4,700 pounds. The machine has been geared down so that practically any hill may be negotiated without trouble. The average speed of the car on high gear is about 13 miles an hour. On this trip the inevitable pets are carried along, these including a French poodle and an immense English bulldog, the latter being taken principally for protection.

Upon leaving Los Angeles the outfit journeyed south to San Diego and after a short stay there was scheduled to leave for Barstow and then across the desert and into New Mexico, and from thence on east. By November they expect to reach New York and after a short stay there they will go to Florida. From that point they will travel north again and visit practically every state in the Union before returning to San Francisco. Most of the return trip will be made over the Lincoln highway, until Utah is reached, from which place they will go to Seattle, and then south. When they land in San Francisco

they will be just as far from home as they will be when in New York, so that there will be nothing for them to do but to keep moving. They are perpetual movers.

Answers to Inquiries for Road Information

Gardner, Mont.—Pacific Coast

YELLOWSTONE National Park, Wyo.—Editor Motor Age—Kindly give me the best route for a walking tour from Gardner, Mont., to the north Pacific coast. Also furnish us with maps, etc.—Robert Lindstrom.

For walking, really, the best maps to have are the U. S. geological survey sheets. If you are unable to procure these for the entire distance you will find it rather hard to procure a guide that will assist a walker. The Automobile Blue Book will give you the directions from the Yellowstone National Park to Seattle, and probably if you are equipped with a pedometer, you could follow the directions without any difficulty, as Volume 5, which covers this territory, would not be any bulkier than carrying a complete set of maps for walking.

Of course there are advantages and disadvantages in having a motor road guide, because, for one thing, it will take you over a good motor road which also is liable to be the longest way around. On the other hand, if you wish to get any pickup by motor car by following a motor road this way, you will have a greater chance of machines giving you a boost.

Cedar Rapids, Ia.—Rapid City, S. D.

Cedar Rapids, Ia.—Editor Motor Age—Kindly give me the best route from Cedar Rapids, Ia., to Rapid City, S. D., via Cherokee and Sioux City, Ia.—F. A. Allen.

We advise that you go north to Waterloo, then west through Cedar Falls, Ackley, Iowa Falls, Webster City, Fort Dodge, Storm Lake, Cherokee, Marcus, LeMars, Sioux City, then north through Westfield, Hawarden, Beloit, Sioux Falls, then from there go west to Bridgewater, Alexandria, Mitchell, Mt. Vernon, White Lake, Kimball, Chamberlain, Presho, Draper, Murdo, Belvidere, Phillip, Wall, New Underwood, Rapid City.

Volume 5 of the Automobile Blue Book will give you complete routing for this trip.

Johnstown, Pa.—Stroudsburg, Pa.

Johnstown, Pa.—Editor Motor Age—Kindly give me the best route from Johnstown, Pa., to Stroudsburg, Pa. Also, give me the best route from Johnstown, Pa., to Cleveland, O.—Roy B. Bantly.

In going from Johnstown to Stroudsburg, Pa., the best routing for you to follow is to go into Bedford, and then through McConnelsburg, Chambersburg, Shippensburg, Centerville, Carlisle, New Kingstown, Harrisburg, Grantville, Greenpoint, Pine Grove, Pottsville, Silver Creek, Tamaqua, Mauch Chunk, Lehightown, Parryville, Carbon, Kregsville, Gilbert, and then to Stroudsburg.

Volume 3 of the Automobile Blue Book will give you complete routings for this trip.

From Johnstown, Pa., to Cleveland, O., the best routing is to go through Blairsville, Greensburg, McKeesport, Wilkinsburg, Pittsburg, Sewickley, Rochester, Beaver Falls, Salem, Alliance, Ravenna, then into Cleveland. Volume 3 also will give you the complete running directions for this trip.

North Loup, Nebr.—Des Moines, Ia.

North Loup, Nebr.—Editor Motor Age—I am planning on making a trip through Iowa in September and want to know the best route to take. I am familiar with the road to Omaha. I desire to go to Des Moines, Newton, Fairfield, Farmington, and Keokuk, and return through Omaha. Give me the route of the Lincoln Highway. Is there a marked road back through the southern part of the state, or would it be better to return through Des Moines.—H. C. Sample.

For the trip you have outlined we do not think you will find it advisable to go over the Lincoln Highway, as this will take you quite a bit out of your way. The better route for you to follow is the River-to-River road, or the Great White Way into Des Moines. The Great White Way goes through the towns of Oakland, Atlantic, Adair, Stuart, Earlham, Van Meter, to Des Moines. From there follow the River-to-River road to Newton, and then to go to Fairfield we advise that you go south to Pella, Oskaloosa, Ottumwa, then to Fairfield. From Fairfield, we think you will find it better to go to Stockport, Houghton, and then south to Keokuk.

Returning to Omaha through Farmington, retrace your route from Keokuk north to Donnellson, and then go west to Farmington, Mt. Sterling, Pulaski, Centerville, Corydon, Leon, Mt. Ayr, Conway, Clarinda, Shenandoah, and Glenwood up to Omaha.

We advise that you procure Volume 5 of the Automobile Blue Book. Price, $2.50. The Automobile Blue Book Publishing Co., Mallers building, Chicago.

Peoria, Ill.—Chicago

Peoria, Ill.—Editor Motor Age—Kindly give me the best route from Peoria, Ill., to Chicago, leaving Peoria by the way of Washington, Metamora and Streator, and arriving at Englewood, Chicago, near Jackson park.—A Subscriber.

For your trip from Peoria to Chicago, we advise either of the following routes from Streator. One way is to go north to Ottawa, Sandwich, Plano, Bristol, Aurora, Naperville, Downers Grove, Hinsdale, LaGrange, Summit, Argo, then straight east on 63rd street, which will take you right to Englewood. The other way is to go from Streator east to Dwight, Reddick, Goodrich, Kankakee, Momence, and then go north through Grant Park, Beecher, Treat, Steger, Chicago Heights, Homewood, Blue Island, and then follow Western avenue to 103rd street, go east to Vincennes and then follow the car line down Vincennes to Halsted street into Englewood. Volume 4 of the Automobile Blue Book will give you complete running directions.

Beaver Dam, Ky.—Fort Dodge, Ia.

Beaver Dam, Ky.—Editor Motor Age—Kindly give me the best route from Beaver Dam, Ky., to Fort Dodge, Ia. I expect to start September 1.—O. H. Taylor.

On your trip to Fort Dodge, Ia., we advise that you go west to McHenry, Central City, Madisonville, then north through Dixon, Cairo, Hendersonville, Evansville, Princeton, Vincennes, Carlisle, Sullivan, Terre Haute, Clinton, Newport, Cayugo, Rileysburg, Danville, Champaign, Farmer City, LeRoy, Bloomington, Mackinaw, Peoria, Brimfield, Galesburg, Alpha, Milan, Davenport, Durant, Moscow, West Liberty, Iowa City, Oxford, Marengo, Grinnell, Newton, Colfax, Des Moines, Dalles Center, Gardine, Ogden, Pilot Mound, Dayton, into Fort Dodge.

Volumes 4 and 5 of the Automobile Blue Book will give you complete running directions.

Des Moines, Ia.—Hayfield, Minn.

Nichols, Ia.—Editor Motor Age—Kindly give me the best route from Des Moines, Ia., to Hayfield, Minn., also the distance.—J. G. Croutcup.

In going to Hayfield, Minn., from Des Moines, the best routing for you to follow is to go north to Elkhart, Cambridge, Nevada, Hubbard, Iowa Falls, Hampton, Rockwell, Mason City, Kensett, Norwood, Glenville, Albert Lea, Austin, Mayfield, and Waltham to Hayfield. Distance to Austin, 191 miles, and Hayfield is but a short distance from Austin.

Volume 5 of the Automobile Blue Book will give you complete running direction.

Collinsville, Okla.—Oklahoma City, Okla.

Collinsville, Okla.—Editor Motor Age—Kindly give me the best route from Collinsville, Okla., to Oklahoma City, Okla.—J. C. Schafer.

We advise that you go through Owasso, Tulsa, Sapulpa, Kellyville, Heyburn, Bristow, Depew, Davenport, Chandler, Wellston, and Arcadia to Oklahoma City.

Paducah, Ky.—Jonesboro, Ark.

Paducah, Ky.—Editor Motor Age—Kindly give me the best route from Paducah, Ky., to Jonesboro, Ark.—Will Schmans.

The best way for you to go is through Maxon's Mills, Woodville, Barlow, Cairo, Rodney, Charleston, Morehouse, Dexter, Campbell, St. Francis, Marmaduke, Paragould, Brookland to Jonesboro.

Frederick, Okla.—Gallatin, Tenn.

Frederick, Okla.—Editor Motor Age—Kindly publish the best route from Frederick, Okla., to Gallatin, Tenn.—W. A. Reddick.

In going from Frederick, Okla., to Gallatin, Tenn., we advise that you go south to Vernon, Electra, Iowa Park, Wichita Falls, Henrietta, Bowie, Sunset, Decatur, Fort Worth, Dallas, Anna, Bonhan, Paris, Detroit, Clarksville, DeKalb, Texarkana, Fulton, Hope, Artesia, Prescott, Arkadelphia, Hot Springs, Little Rock, Lonoke, Clarendon, Forrest City, then to Memphis, Arlington, Brownsville, Jackson, Huntington, Camden, Waverly, Dickson, Ashland, Nashville, Hendersonville, Gallatin.

Volumes 5 and 6 of the Automobile Blue Book will give you complete running directions for this trip.

Dougherty, Ia.—Crystal Falls, Mich.

Dougherty, Ia.—Editor Motor Age—Kindly give me the best route from Dougherty, Ia., to Crystal Falls, Mich. I would like to go by way of Chicago and return via St. Paul, Minn.—C. H. Christions.

In going to Crystal Falls via Chicago we advise that you go to Clarksville, Waterloo, Washington, Auburn, Cedar Rapids, Marion, Mechanicsville, Clarence, Wheatland, DeWitt, Clinton, Sterling, Dixon, Rochelle, DeKalb, Geneva and Chicago. Then go north to Evanston, Highland Park, Waukegan, then follow the Green Bay road through Truesdell to Milwaukee, then north through Port Washington, Cedar Grove, Sheboygan, Manitowoc, Bellevue, Green Bay, Brookside, Oconto, Peshtigo, Marinette, Menominee, Stephenson, Talbot, Nadeau, Spaulding, Noretta, Norway, Iron Mountain, Florence to Crystal.

You can return by way of St. Paul, although roads are not very good. We advise your going from Crystal Falls to Iron River, then to State Line and Eagle River, from there to Three Lakes, Crandon, Antigo, Birnanwood, Wausau, Abbottsford, Thorpe, Chippewa Falls, Eau Claire, Menomonie, Hammond, Hudson, St. Paul, Minneapolis, and then south through Northfield, Faribault, Austin, Lyle, Osage, Charles City, to Dougherty.

For this trip we advise that you procure volumes 5 and 4 of the Automobile Blue Book which will give you complete running directions.

The Motor Car Repair Shop

Facts Concerning Magnet Rechargers

AT THE present time there are on the market certain forms of magnet chargers, some good and others worthless. To tell a good one from a poor one, the first thing to ascertain is whether the cross-section of iron in the charger is equal or greater than the cross-section of steel in the magnet. For instance, the largest single magnet to be found on a magneto is about ½-inch by 1½-inch. This equals .75 square-inch. A charger suitable for this magnet should have an area at least equal to this. It might measure 1-inch in diameter or ⅞-inch square or ½- or 1½-inch as long as its area is equal or greater than .75 square-inch. To try to charge a magnet as large as this, with a charger of smaller cross section than .75 square inch would only result in a weak charge or none at all.

Some of the chargers on the market have iron cores as small as ½-inch diameter. This figures about .20 square inch and it will be clear that this charger will be good only for magnets about one-quarter as large as the one measuring ½ by 1½-inch above.

Length of Charge

It is fallacy to think that leaving the current on for as long a time as 5 minutes or more will accomplish any good. This is a subject about which there seems to be much misunderstanding, there being a number who recommend any length of time to leave the current on from 1 to 10 minutes, when the useful work of the charger is completed in less than a second. The important point is to have agood supply of energy to feed the charger and to use a powerful current. Dry cells should not be considered as a good supply of energy as they are too expensive, and storage batteries are very common and cheap to use.

The service of magnet charging is also very severe on dry cells due to the large current required. A charger that is taking a good powerful current can always be recognized by the way it gets hot when current is left on for a few minutes and a good idea of the charge can be obtained by the force of attraction between the magnet and charger when the current is turned into them.

It might also be added that a great deal of magneto trouble is laid to weak magnets, when no other cause is known. Magnets made of good steel will hold 90 per cent of their original charge for many years, and there are almost no makers of magnetos who do not use good steel. Magnets can have their charge weakened or reduced to nothing, by accidentally getting a battery connected to their terminals, when the armature has not stopped in the correct position to prevent this effect. Generally the trouble is due to worn out contacts, poor breaker adjustment, or worn out bearings which allows the armature to rub the magnets. Very seldom is a magneto found with an open circuit in the secondary winding, or a breakdown in its insulation and the other possible causes of trouble should get first consideration.

Specifications for Charger

Below is given the specifications of a magnet charger, which will give perfect results from a 6-volt battery. By using a coil of finer wire, it will then charge from 110-volt or 220-volt direct current mains. The pole pieces AA are made preferably of cold rolled steel ¾ by 1½ by 5¼ inches long, although rough black iron will do as well.

The core B is 1¼ inch in diameter, cold rolled steel, 2⅝ inches long with its opposite ends faced off. Through the center is the hole for the ⅜-inch bolt, as shown, which clamps the whole thing together. The winding C is retained on the core by ⅛-inch fiber washers, 2¾-inches outside diameter and 1¼-inch inside diameter with a press fit on the core B. After thoroughly taping the core to prevent grounds, the spool is ready to be wound. Start the wire in hole D and end in hole E. For a 6-volt winding, use 1⅔ pounds of copper magnet wire No. 12 D CC. For good results, wind a layer of stiff paper between each layer of wire.

For 110 volts use 1¾ pounds of copper magnet wire No. 25 S CC, taking care to wind at least six or seven layers of paper between the layers of wire. It might be added, that it is not necessary to carefully wind this fine wire in even layers.

For 220 volts use 1¾ pounds of copper magnet wire No. 28 S CC. When through winding tape the coil well to protect the wire. Use flexible wires, such as lamp cord, to bring out the beginning and end of the wire through holes D and E.

The 6-volt winding will take about 30 amperes, the 110-volt—2 amperes, and the 220-volt—1 ampere. Since this is quite a little energy for a small coil, it would overheat if current were left on continuously, but since it will only be used intermittently for a minute or so at a time, it will give the advantage of a very powerful charge.

Incidentally, it might be added that it is wise for one to be careful where one has one's fingers when the current is turned on, as many severe cuts and bruises have resulted from a magnet jumping to the charger, when one's fingers are on the pole pieces.

Alternating Currents

If the supply of lighting current is alternating, it is advisable to wind for 6 volts as there is very seldom a garage where a starting battery cannot be found on some car.

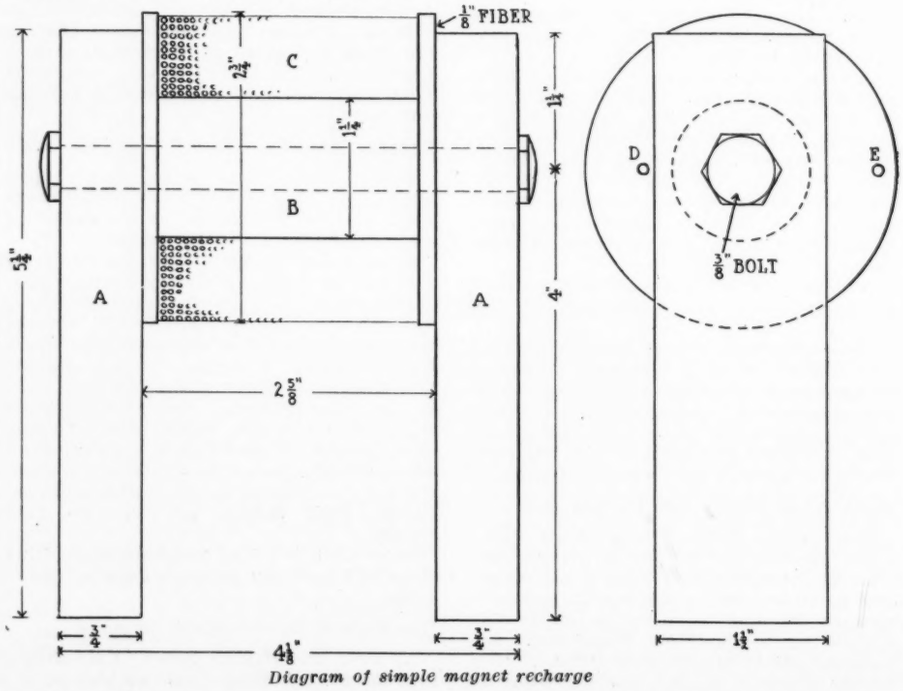


Diagram of simple magnet recharge

Kissel All-Year Bodies for Light Six Chassis

Town Car Latest for Hundred-Point Model

KISSEL is ready with the All-Year bodies applied to the 1917 hundred point-six chassis. Although removable-inclosed bodies will continue to be mounted on the six-42, which is the big six of the line, the current announcement concerns only those offered with the light chassis.

The tops include the sedan and coupe which were applied to the larger cars last season, and a new and swagger town-car top mounted on a Victoria body. Kissel designers have sought to attain tops of such lines and such perfect fit that they would have all the appearances of permenantly enclosed cars, and a view of the new models is convincing that they have succeeded.

The main frame and door frame of the demountable tops are of heavy selected white-ash and elm, firmly joined and covered with sheet steel. The roof is three-ply paneled white-wood under heavy duck canvass, laminated. The windows are French plate glass and are set solidly into hard channel rubber to prevent leaks and rattling. Standard specifications call for leather lining of the tops, but special cloth linings to suit the purchaser's tastes are furnished upon special order.

Solidly Attached to Body

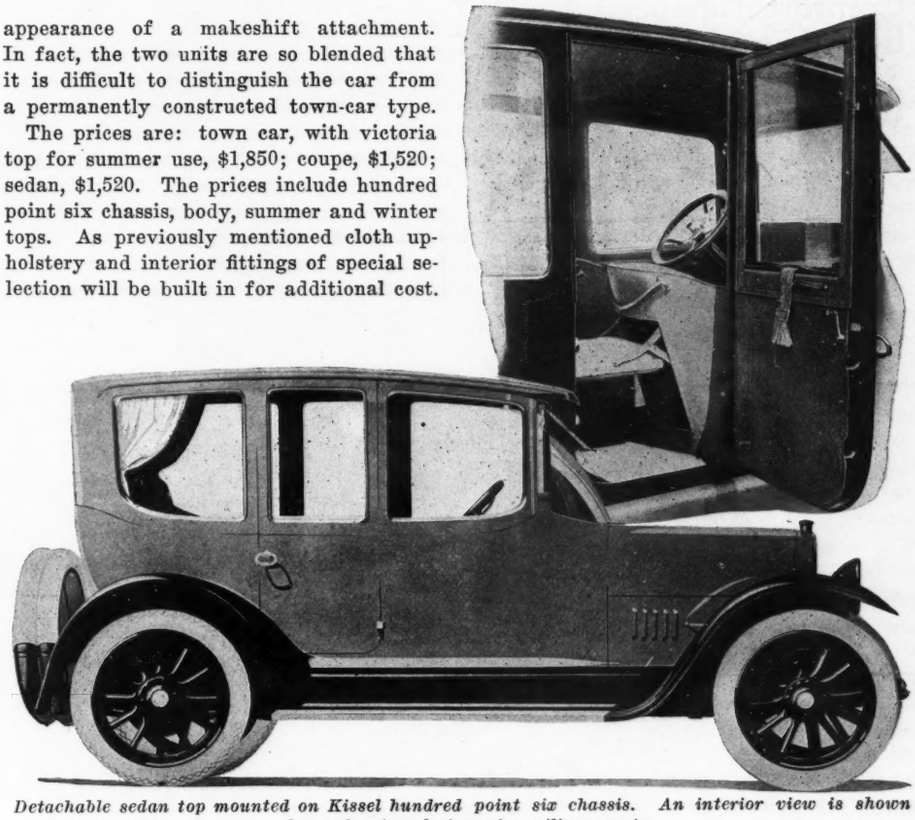
The top is solidly attached to a body which is reinforced suitably to take care of the additional weight. This body is known as the Kissel Gibraltar, and it is built with the top so that the two assemblies may be an exact fit. Kissel will not build tops separate from the bodies.

The body and top are joined at ten points by means of rectangular bolts fitted into sockets. The joining, when completed, leaves nothing in sight either inside or outside. A layer of felt and non-squeak material is inserted between the top and lower body as a noise preventative. As the halves are attached, spring plungers connect the electric wiring automatically.

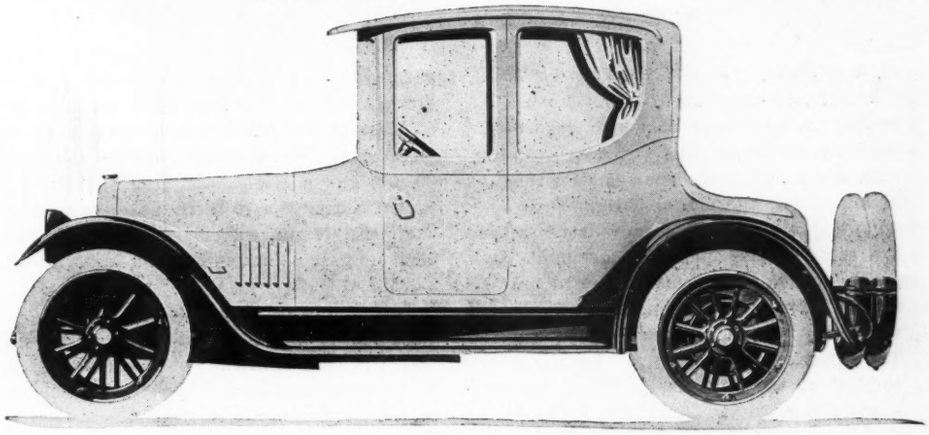
Ventilation is effected through the double windshield and the door windows, the latter adjustable to any desired height and so constructed that they will drop down into the doors their full length. All Kissel bodies are built with divided front seats with a wide corridor between. There are spacious storing facilities under the seats.

The new town car brings out the first application of this type of top by Kissel. As evidence of its completeness an eave is provided on the front end of the top directly over the driver's seat to prevent water from running off of the top onto the upholstery. The front end of the top is curved into the top ridge of the lower body, which tends to get away from the appearance of a makeshift attachment. In fact, the two units are so blended that it is difficult to distinguish the car from a permanently constructed town-car type.

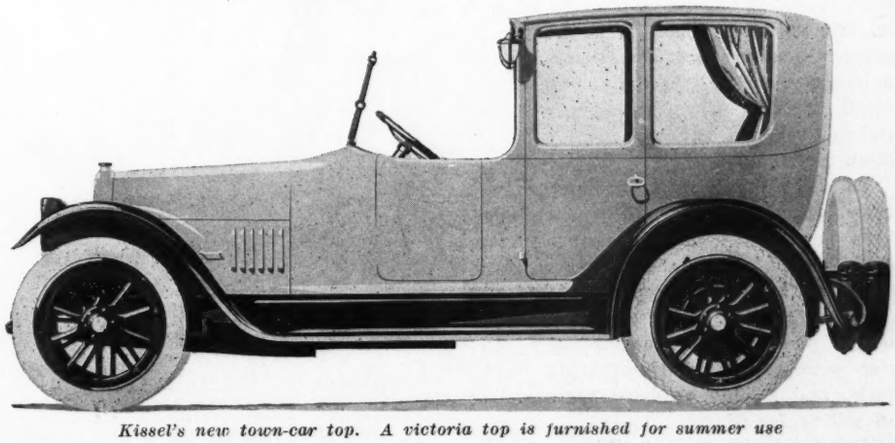
The prices are: town car, with victoria top for summer use, $1,850; coupe, $1,520; sedan, $1,520. The prices include hundred point six chassis, body, summer and winter tops. As previously mentioned cloth upholstery and interior fittings of special selection will be built in for additional cost.



Detachable sedan top mounted on Kissel hundred point six chassis. An interior view is shown above showing design of auxiliary seats



Detachable coupe top on Kissel four-passenger roadster body

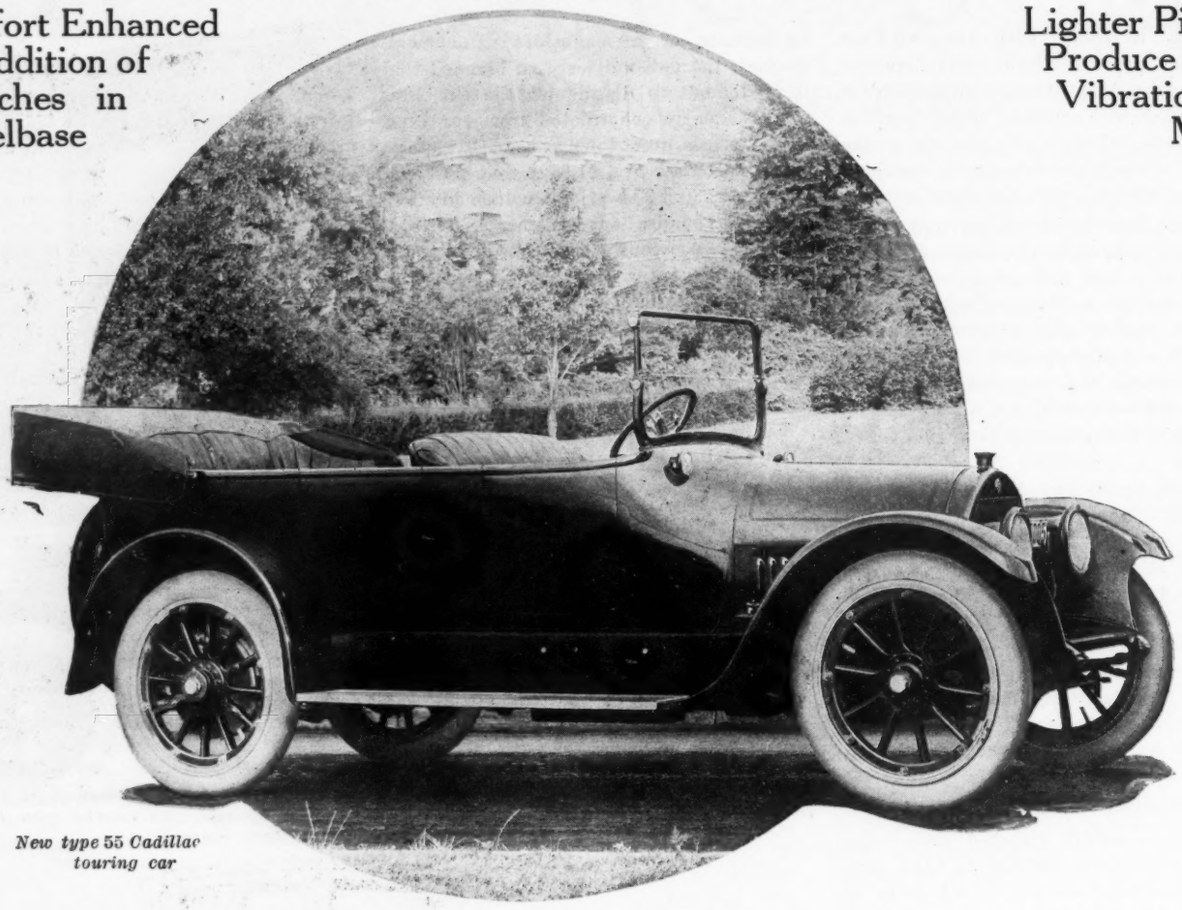


Kissel's new town-car top. A victoria top is furnished for summer use

Eleven Body Styles in New Cadillac

Comfort Enhanced by Addition of 3 Inches in Wheelbase

Lighter Pistons Produce More Vibrationless Motor



New type 55 Cadillac touring car

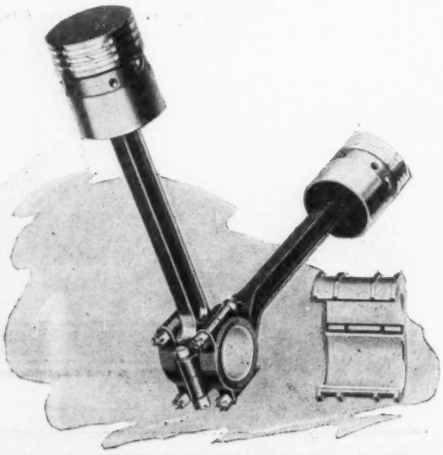
AS a luxury vehicle, the type 55 Cadillac, just announced, is much more desirable than the type 53 which it succeeds, good as the latter was. Notwithstanding this, the price of the open models remains at $2,080 but the closed designs are somewhat higher. Dark blue now is the standard color on the open cars, although dark green, which has been standard on all models since the first eight was announced, will still be used on the closed models. The appearance is enhanced by the adoption of crowned fenders, the addition of a moulding around the top of the body, and new headlamps which, in a general way, follow the shape of the coat of arms on the radiator. Comfort is greater because of a more vibrationless motor, softer upholstery, longer wheelbase, now 125 instead of 122 inches, roomier body and Gabriel rebound snubbers.

More Body Models

To meet the growing demand for variety, the number of body models has been increased to eleven, four open and seven closed. In the former class, in addition to the seven-passenger touring with disappearing seats, there is a four-passenger phaeton, two-four-passenger roadster with a pair of disappearing rumble seats, and a club roadster seating four, all selling for $2,080.

There are two convertible cars with permanent roofs and disappearing windows; one, a four-passenger victoria at $2,550 and the other a seven-passenger at $2,675. A four-passenger coupe sells for $2,800, and a five-passenger brougham for $2,950. There are three seven-passenger cars with 132-in. wheelbase, a limousine at $3,600, and a landaulet and imperial at $3,750.

The upholstery is softer and much more comfortable due to a new form of spring which is very resilient yet is so made that it will not settle with continued use, it is said. Another improvement involving both appearance and comfort is the adoption of dull-grained leather instead of the glazed and it is plaited instead of tufted.



Hour-glass type pistons of new Cadillac eight. At right is the die-cast bearing

Convenience, comfort and appearance have been increased in many small ways. Gearshift and emergency brake levers are easier to operate since their length has been increased a couple of inches. A wrench is no longer required in order to remove the gasoline filler cap since the threaded type has been replaced with one which locks by a handclamp. The gasoline gauge now may be easily read at night without straining the eyes or making a light since the tail light has been modified so that it illumintes the gauge. The radiator is better protected against splashing mud by using a horizontal guard between the frame members instead of a slanting one.

Pistons Are Clipped

One pound has been clipped from each pair of pistons and connecting rods. The reduction is due largely to a different design of piston which, however, is cast as heretofore. The center portion is cut away so that the piston bears against the cylinder only at each end. Lightness and reduced friction are thus obtained, the latter since the amount of piston surface coming in contact with the cylinder walls is less. Unfailing and adequate lubrication of the cylinder walls is assured be-

cause of the oil which gathers in this depression. At the same time over-lubrication is prevented by the presence of several holes which run to the interior of the piston and thus allow the excess oil to drop to the crankcase. Along with the new piston design, the wristpins have been enlarged to give longer wear.

Accessibility of the valves is improved by a 2¼-inch wider valve alley due to placing each exhaust pipe 1⅛ inch closer to its cylinder block.

The frame is more rigid, partly because the depth of the channels has been increased from 6 to 8 inches but also because tubular cross-members, one at the front and two at the rear, are now used. These are both stronger and lighter.

The thrust of the drive pinion is better taken care of by putting both bearings ahead of the pinion instead of one on each side as heretofore.

Except for the changes noted, the new chassis is the same as 1916 and not much different from the original design brought out in September, 1914. Cylinders are 3⅛ by 5⅛ inches, giving a displacement of 314 cubic inches and actual horsepower of 70, and an N. A. C. C. rating of 31.25.

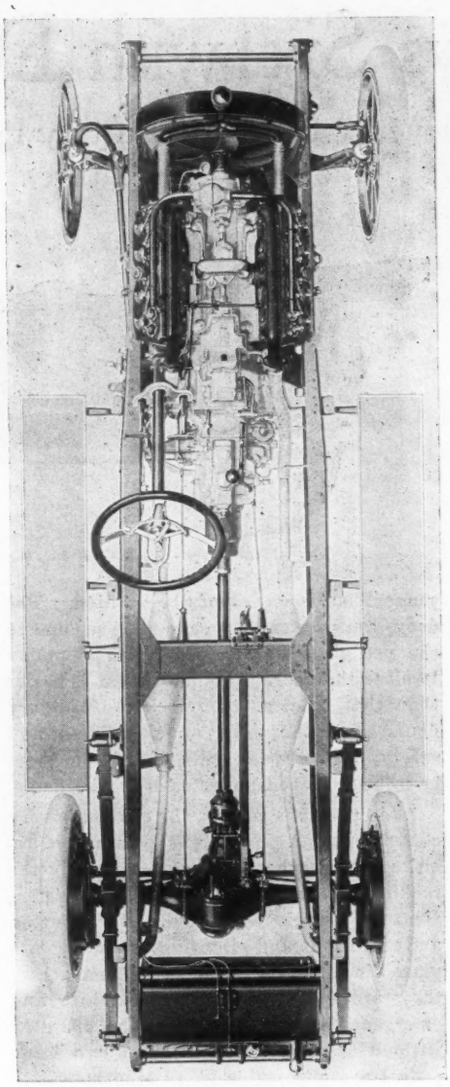
L-head cylinders, cast in two blocks, are mounted on an aluminum crankcase, with clutch and gearcase in unit. Camshaft and generator shaft are driven by silent chains, located in the front. A double-throw crankshaft is used the same as in a four, each throw having two mating connecting rods, one being attached to the crankshaft in the usual way and the other being forked and fitting over the first one.

Bearings of Bronze

The crankshaft has three bearings and the camshaft five. The main bearings are reinforced bronze, babbitt-lined. Each cam operates two opposite valves. The camshaft assembly is on the underside of a plate which bolts to the top of the crankcase between the cylinder blocks. On each side is pivoted a row of eight rockers, each rocker having a cam roller; thus the motion is transmitted from cam to push rod.

Lubrication is force-feed, a gear pump driven from the crankshaft drawing oil from the reservoir in the bottom of the crankcase and forcing it through pipes to each of the main bearings. From thence the oil makes its way to the connecting-rod bearings through passages drilled in the crankshaft. Lubrication of the camshaft bearings is taken care of by the overflow from the safety valve in the main oil line. Above a certain speed, this valve opens and the excess flows through a pipe connecting to the camshaft bearings. Pistons and cylinders are lubricated by overflow from the main and connecting-rod bearings.

Cooling water temperature still is controlled by a thermostat, there being one for each block of cylinders; there is a pump for each also. When the temperature drops below a certain amount the thermostat automatically closes off the supply of water from the radiator, thus causing the water in the jackets to circulate and recirculate until the temperature rises.



Plan view of Cadillac 55 chassis showing accessibility of motor ports and new rear-end arrangement

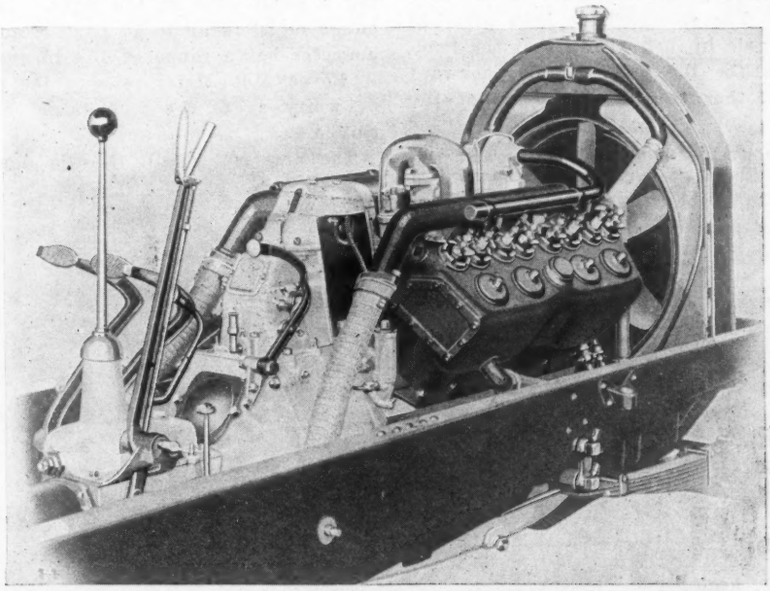
The specifications include a multiple, dry-plate clutch having fifteen carbon steel plates 7¾ inches in diameter, three-speed gearbox, floating rear axle with spiral drive and a pressed-steel housing, tubular open drive shaft with two universals, platform springs in the rear, 20-gallon gasoline tank with fuel fed to the carbureter by pressure, Delco two-unit starting and lighting system, and Delco ignition, power tire pump attached to the gearcase, tires 36 by 4½, smooth in front and non-skid in rear.

MOTOR CONQUEST OF YOSEMITE

Camp Curry, Yosemite National Park, Cal., Aug. 19—The motor conquest of the Yosemite National Park, begun 3 years ago, has been carried through to victory this summer, and private cars are now carrying more tourists into the park than all the railroad and motor transportation companies combined. More than 2,700 cars of ninety-seven different makes, carrying licenses from nearly half the states of the union, entered the national playground before August this year.

The troublesome restrictions once imposed on motorists by the authorities have been removed and motor cars now pass freely over Yosemite roads. Maps, official road rules and other things of interest to motorists have been embodied in a folder issued by David A. Curry, proprietor of one of the resorts of the Yosemite valley.

Every tourist who enters the valley uses motor transportation at one stage or another of his journey. The railroad ends just outside the park boundary and motor stages of large capacity carry the tourists up the canyon of the Merced River to the resorts of the valley floor. Another stage line operates touring cars between the railway terminus and the resorts by way of the Tuolumne grove of big trees.



The valve alley of the new 55 Cadillac is less congested, due to putting the exhaust manifold closer to the cylinder block

New Willys Six with Double Cowl

Cantilever Springs and Battery Ignition Among Later Features

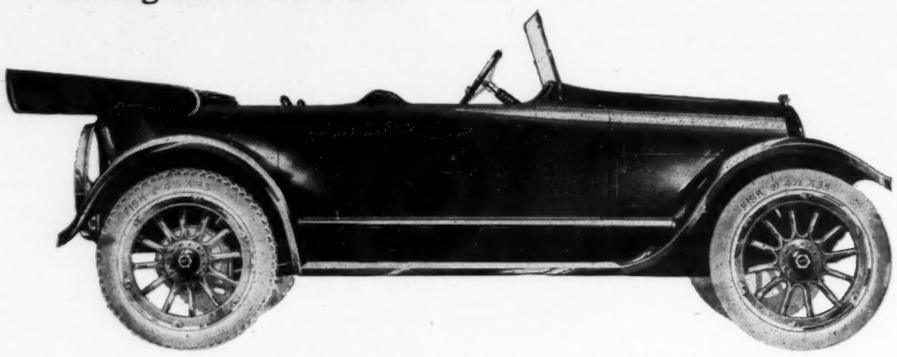
WITH the exception of a longer hood, the new Willys seven-passenger 88-six, at $1,325 is identical in outward appearance with the Willys-Knight four recently described. Cantilever springs have been substituted for three-quarter elliptics, battery ignition through the Connecticut system of distribution has taken the place of the magneto, the gearbox used on the 1916 Willys-Knight has been adopted and the gasoline tank has been removed from under the seat to the rear of the car, the change bringing with it the installation of a Stewart vacuum feed system. The motor is a continental and starting and lighting is performed by the Auto-Lite system.

Comfort and beauty are the features of the new car. The lines are unbroken from front to rear. The radiator edges are rounded and the radiator is slightly higher; the top edge of the body is rolled in and there is a double cowl and tilted windshield. All these details combine to give a very attractive car.

Dark Blue Body

The body is dark blue with gray wheels. Metal fittings are nickel and polished aluminum, and fenders and trimmings are black enameled.

The upholstery is unusually soft due to the use of smaller springs and because each one is in a canvas casing which acts as an air chamber giving a pneumatic cushion effect. The body is roomier. There is plenty of knee room when the auxiliary seats are up. Cantilever springs, 48 by 2½ inches make this the easiest riding Overland since it also has the longest wheelbase, 125 inches, larger tires than usual, 35 by 4½, contribute to the easy riding. The springs have been attached to the axle in such a way that the tendency is for the axle to roll backward slightly, thus reducing the force of the shocks.



Side view of Willys six touring body, showing double cowl

The convenience of both driver and passenger has been carefully studied. The doors are particularly easy to open, due to the use of a new handle which is pulled to close the door. This movement is easier than that required to unlock the ordinary door. For the sake of cleanliness and safety, rubber pads with ridges on them have been placed under each of the doors.

As in previous models, the control is very convenient. A very light pressure is required to disengage the clutch, merely the rocking of the foot on the heel being sufficient to depress the pedal. Horn button and ignition and lighting switches are placed in a box on the steering post, where they are easy to reach. Gearshift and emergency brake levers may be operated without leaning forward. The two large pedals are adjustable as to length.

The cowl board equipment is complete, including a Warner speedometer with ½-inch figures on the speed indicating cylinder and ¼-inch figures on the 100,000-mile indicator, and on the 100-mile trip register. The latter may readily be set back by turning a small knob at the right. The oil gauge registers up to 10 pounds, and the ammeter has a range of 15-0-15 amperes. A Boyce Moto-Meter relieves the driver of worry as to the temperature of the engine.

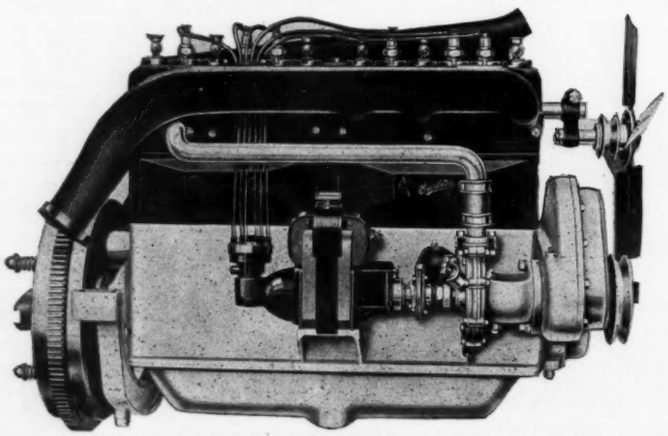
The new motor will throttle down as low as 4 miles an hour on high gear and still run smoothly, and will pick up quickly from this speed without any difficulty. The motor is rated at 45 horsepower, and has a gear ratio of 4 to 1. The bore and stroke is 3½ by 5¼, giving an N. A. C. C. rating of 29.4 horsepower and a piston displacement of 303 cubic inches.

The motor is a standard Continental model, with L-head cylinders cast in a block and mounted on a two-piece aluminum crankcase, the lower part serving as an oil reservoir, and the upper carrying the ball-bearing crankshaft. Accessibility is fostered by placing the ignition distributer, the generator and the water pump in a straight line on the right side. These units do not interfere with reaching the valves. Each is mounted on a bracket on the motor and may be removed without disturbing any of the other units.

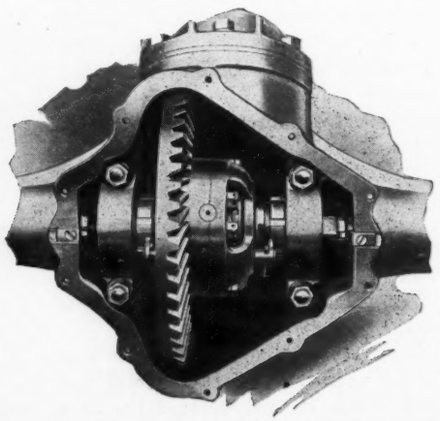
Accessible Motor

This leaves the left side of the motor clear for the installation of the steering gear and the starting motor, access to both being easy. The oil filler opening is at the front on this side and the oil gauge is plainly visible from its position at the center near the bottom of the crankcase.

Electrical equipment consists of an Auto-Lite, two-unit, 6-volt system with head, tail and dash lamp, and headlight dimmers,



Distributor and exhaust side of Willys six motor



Spiral bevel drive is utilized in the rear axle

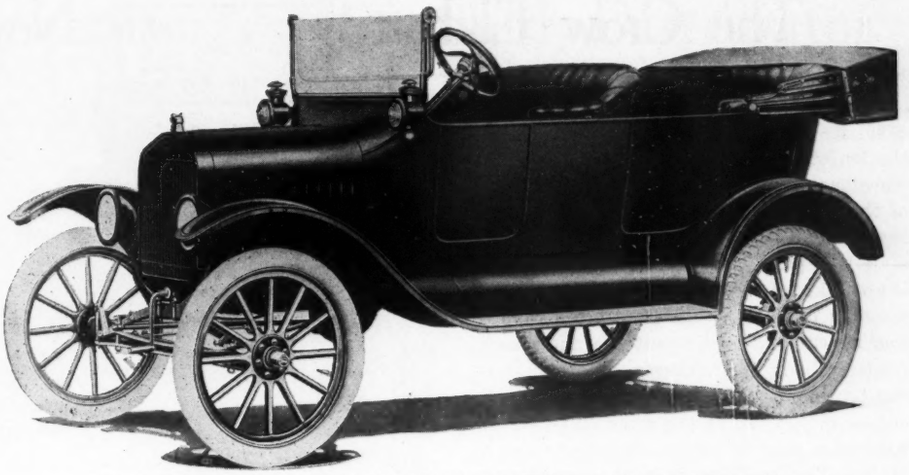
as well as an ammeter. The starting motor is mounted high, in order to keep it away from dust and dirt, as well as to make it accessible, drive being by Bendix pinion which meshes with teeth in the flywheel. Back pressure is minimized by the fitting of a double exhaust pipe, there being a passage from the three front cylinders and another from the three rear ones.

Lubrication

Lubrication is a combination of force and splash-feed, a plunger pump operated from the camshaft, sending oil under high pressure to the main crankshaft bearings, pumpshaft bearings and the timing gears. Troughs catch the overflow and dippers on the connecting-rod caps distribute spray to all parts of the motor.

The clutch is a cone with a leather facing and spring actuated plungers which are equally spaced and give smoother engagement by pressing out on the face of it. The clutch spider is held in engagement by three light springs placed near the rim and gearshifting is facilitated by a clutch brake. The gearbox is mounted on the rear axle, and torque and driving strains are taken by a torque tube which terminates in a yoke, which is pinned to a cross member of the frame. The gearbox gives three speeds forward and reverse. The gears are said to be double heat-treated nickel steel of the stub-tooth type. The main shaft is mounted on annular ball bearings and the countershaft is stationary, but the countershaft gears rotating on it have Hyatt rollers placed between them and the shaft. The rear axle is a floating type with a spiral-bevel gear drive, and Timken adjustable taper roller bearings throughout.

Service and emergency brakes are internal and external, acting on the same pair of drums, the former contracting and the latter expanding, the respective dimensions being 14⅜ by 2¼ and 14 by 2¼. Both are quickly adjustable. The front axle is a I-beam drop forging produced in one heat without welding, and the wheels have adjustable taper roller bearings. The steering gear is a worm and full gear type of hardened steel on adjustable ball bearings.



Ford touring car improved in looks by new radiator and hood and adoption of crown fenders

Fords Changed in Appearance

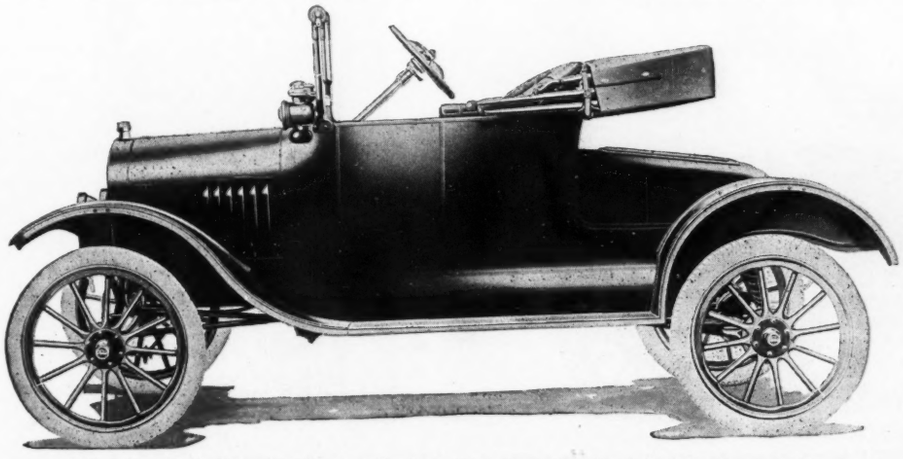
New Radiator, Hood and Fenders

CHANGES in the new Ford cars are principally in the externals. They are the fitting of an entirely new radiator of black enamel, which is about the same width and height of the present one, although it has the appearance of being of slightly less thickness, the use of a sloping hood that eliminates any break where it joins the body, the addition of crown fenders front and rear, which conform to the curve of the wheels in most modern fashion.

Besides these external changes, which add a great deal to the general appearance of the car, there are two minor changes under the hood. One is the fitting of a shield around the fan, this concentrating the air and insuring its going to the whole of the radiator surface as an aid to efficient cooling, and the other is the fitting of an electric horn. This horn is mounted at the right rear side of the cylinders between them and the steering column. It is of the vibrator type and is arranged to operate from the current of the fly-wheel magneto, and the button is mounted on the steering column just under the wheel.

There are no other changes. The wheelbase and body remain identical with the previous model. The new radiator shell is a stamping in two pieces, one the shell proper and the other the top portion that bears the Ford name stamped in it. The familiar Ford filler cap and radiator spout of brass protrude at the top. Now that the radiator is enameled, there is really very little brass about the car, only the filler and hub caps being of the metal formerly used.

The shape of the new radiator is very pleasing in that there are no abrupt edges as in the type that has become familiar the world over, the new shell having rounded edges where the side parts of the shell curve into the top portion, and the front edge is also rounded over. The new hood is provided with louvres in the sides and is so shaped that there is an unbroken line from the radiator to the body proper, and it, as well as the radiator and fenders, have been given a high finish. The fenders are substantial pressings that are free from vibrations when in position on the car. They are well fastened to the chassis and body.



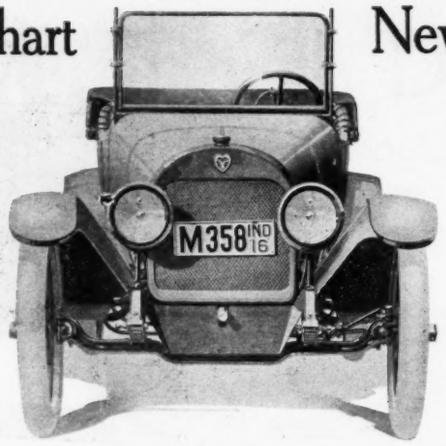
New Ford roadster, showing unbroken lines brought about by use of new radiator and hood

THRESHERMEN DISLIKE ROAD LAW

Columbus, Ohio, Aug. 19 — The Ohio threshermen are after State Highway Commissioner Cowen. There is a provision in the Cass road law that forbids the use of traction engines on improved highways. Most of the through roads of the state are now improved wholly or in part. Nearly all threshing outfits are drawn from farm to farm by traction engines, and the thrashermen say they are often compelled to cut across farms cutting wire fences and building temporary culverts so as not to run the risk of arrest. Holding that the traction engine will not prove as harmful to improved roads as motor cars, they demand that the provision be waved as to them.

The Crow Elkhart New Touring Body

THE improvements in the 1917 mid-season model Crow Elkhart 35, selling at $795, lie mostly in body construction and the lengthened wheelbase of the car. The wheelbase is now 114 inches and the body of the car is lengthened three inches in the tonneau. A streamline body of approved style is applied to the touring model. The Crow Elkhart idea of a roadster is that it must be of entirely different lines than a touring car and as a result the mid-season roadster body is strikingly different from the touring model. In fact the two could not be recognized as the same make of car without a view of the characteristic nameplate. The roadster is a three-passenger type known as the cloverleaf and is continued without change.



Front view of mid-season Crow-Elkhart touring car

More Room in Bodies

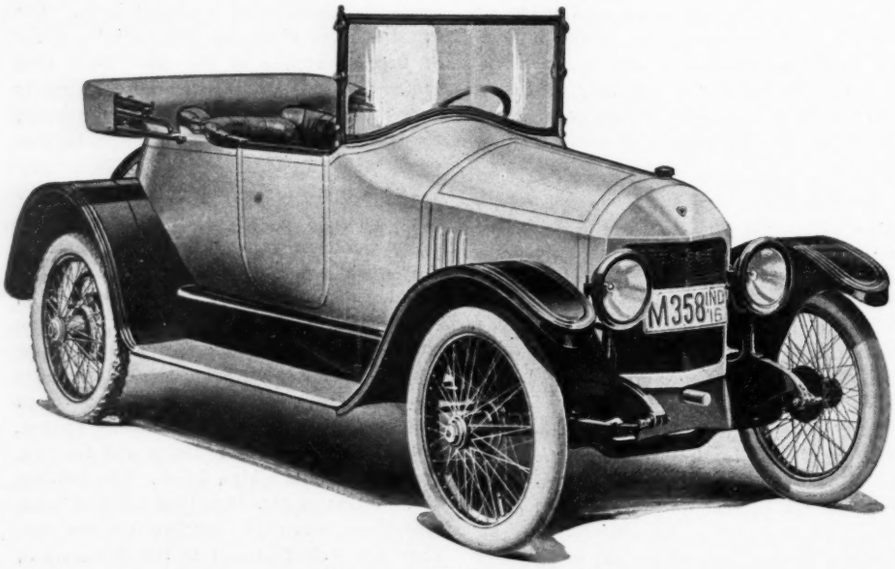
Particular stress has been laid on roominess, in the design of the new body. The rear seat of the touring car tonneau is 49 inches wide, and to make space for this very wide seat the body is undercut for the fenders and wheels. The space between the rear and front seats is sufficient to allow ample room for auxiliary seats without cramping any of the passengers or blocking the rear doors.

The new curved-front radiator, a different shape of hood and a new windshield application are also features of this model. Instead of the plain fenders applied to the 1916 models, dome fenders of graceful sweep have been adopted for all of the 1917 models.

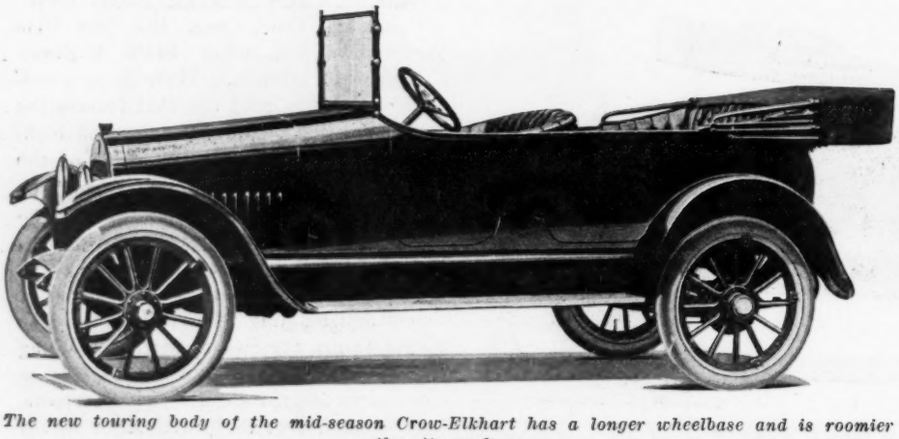
The chassis principles of the car remain fundamentally the same as they have for the past 8 years. The motor is rated at 35 horsepower, has a detachable head and the pistons contain oil ports for the conservation of lubricant. The design is to prevent oil from ascending between the pistons and the cylinder walls to the combustion chamber. The gearset, rear axle, starting and lighting systems are of the same type utilized in the 1916 Crow Elkhart models.

GAS ORDINANCE VETOED

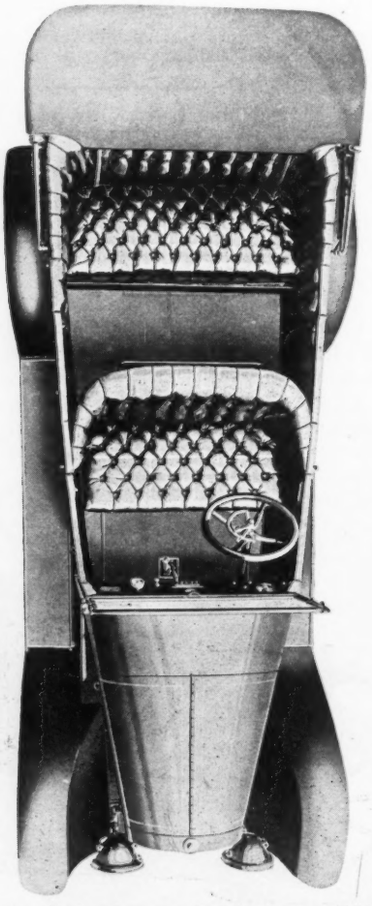
St. Louis, Mo., Aug. 18—Mayor Kiel has vetoed the proposed gasoline ordinance which would have prohibited pouring more than 3 gallons of gasoline in automobile tanks on the streets. More than 100 small dealers and grocers protested the ordinance at the public hearing. The mayor, in vetoing the bill, said that permitting the pouring of 3 gallons of gasoline destroyed its effect as a safety measure. The ordinance was introduced by Alderman Renick, a salesman for the Pierce Oil Corp., which owns about one-fourth of the 100 filling stations in the city. An outside protest came from the produce district where practically all of the delivery trucks get their gasoline from oil wagons. All of the motor associations protested the bill, which was passed by the aldermen.



Crow-Elkhart cloverleaf roadster



The new touring body of the mid-season Crow-Elkhart has a longer wheelbase and is roomier than its predecessor



New seating arrangement of 1917 Crow-Elkhart touring model

New Breaker Mechanism in Pittsfield Distributor

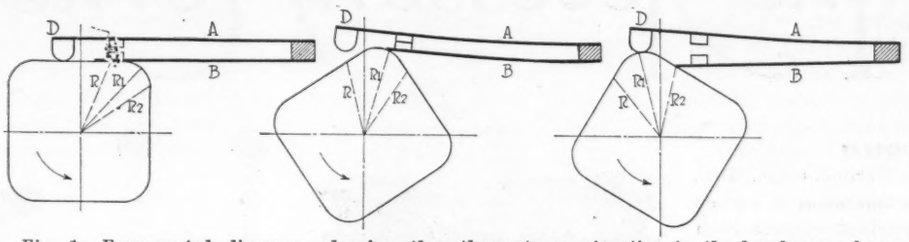


Fig. 1—Exaggerated diagrams showing the three stages of action in the breaker mechanism of the Pittsfield distributor for battery ignition

A BREAKER mechanism for an ignition distributor in which both the make and the break are positive mechanical operations, neither depending upon the rapidity of action of the spring, is the briefest possible description of a new device recently evolved by the Pittsfield Spark Coil Co., Pittsfield, Mass.

Despite its unusual action the device is extremely simple and it is explained by the series of diagrams in Fig. 1. The essential feature is the use of the two stout spring steel pieces A and B. It will be noticed that each of these carry a contact point and that A is longer than B. The cam shown is square with rounded corners, but it would be, of course, hexagonal for a six-cylinder engine, octagonal for an eight, and so on.

Striking radii from the center of the cam and considering the three, R, R_1 and R_2, it is obvious that R_1 is the longest, while R and R_2 are of equal length.

Cam Operation

As the corner of the cam sweeps past the free ends of the springs they will be lifted and, if the rotation is in the direction of the arrow, B will begin the lift first, while A will lift a trifle later. In the middle diagram of Fig. 2, the parts are shown in the position where the end of B is just in contact with the end of the radius line R_1. At the same instant D, the extremity of A, will be in contact with the cam at the end of the radius R. This means that with the cam in this position B has has been lifted to the highest point which it will attain, while A still has some short distance upward to travel as the cam turns further around in their course.

The clearances are so arranged that the amount of advance life given to B is just sufficient to raise it until the platinum contacts meet. In other words, D is lifted out of contact with the cam just a hair's breadth when B is at its extreme limit of travel.

If the cam goes on turning it is obvious that B will fall again by the action of the spring, which would break the points apart, but this is not relied upon, as the spring cannot act quickly enough. Suppose B remains suspended in the air after the corner of the cam has passed on; that the spring only acts quite slowly. Now turn back to the middle diagram of Fig. 1 and consider D, the end of blade A. As soon as the cam turns into the position shown in the right-hand diagram of Fig. 1, D must be lifted, and blade A will thus be raised so high that the contacts will separate even if B has not adhered to the cam.

Putting this another way, in Fig. 1, first position, both A and B are resting on the side of the cam and the platform points are not in contact. As the cam turns it first lifts B, bringing the points together. This causes A to be lifted a little, thus keeping the contacts together with a firm pressure. Immediately the point of the cam strikes D the circuit is broken, and thus the cam mechanically makes and immediately afterward mechanically breaks the circuit. Since both the make and break are made by the cam, both are equally positive and the contact can neither fail to make nor fail to break and the strength of the springs does not affect the action.

Owing to the short duration of the contact, current consumption is small and the positive action is claimed to permit the distributor to operate perfectly at speeds in excess of the highest engine speed demands.

The whole distributing outfit is made up into single units 6 in. high by 3½ in. diameter. It includes the coil and condensor in symmetrical arrangement, so that the only external wire is a single lead to the battery in addition, of course, to the high tension leads to the spark plugs. The latter are stationary since the breaker box is moved independently of the cables. The distributor coil and the condensor may be conveniently removed in one piece, uncovering the interruptor mechanism for adjustment and at the same time showing up a set of complete printed instructions for operating the same. The manufacturers are at present prepared to furnish this igniter for four, six or eight-cylinder engines, and they will shortly be in a position to supply a twelve-cylinder distributor.

DIXIE MEETING IN DETROIT

Chattanooga, Tenn., Aug. 18—Judge M. M. Allison, president of the Dixie Highway Association, has called a meeting of the board of directors of the association, to be held at the Hotel Tuller in Detroit, Mich., August 25. From the responses which have been received from the twenty-two members of the board representing eight states, a majority of the members will be present.

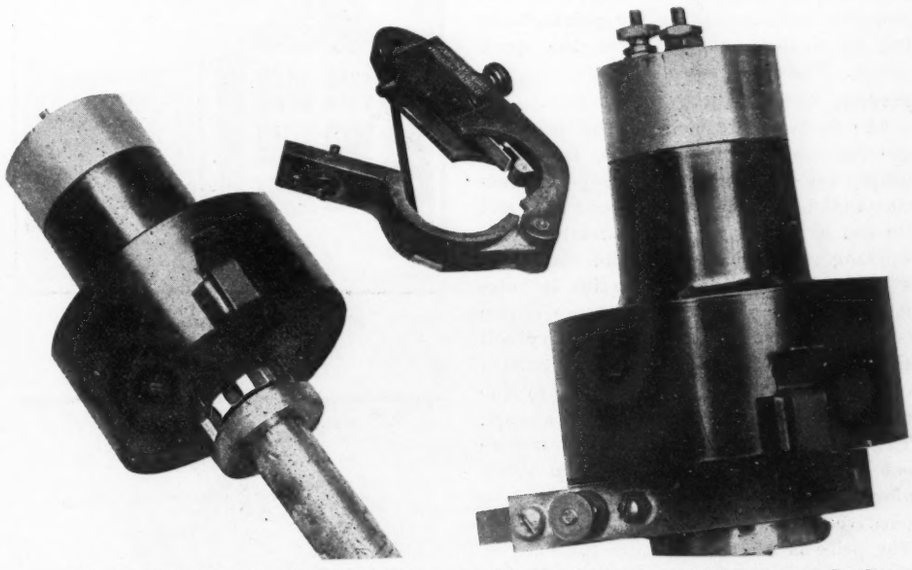
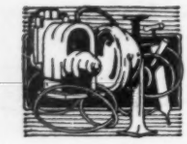


Fig. 2—Pittsfield distributor complete and with the breaker mechanism removed, the method by which the breaker box comes off is obvious. The coil is contained in the upper part of the body, which is stationary, only the breaker moving to give advance



The Accessory Corner

Petroleum Carbon Remover

THE American Oil Products Co., Inc., Buffalo, N. Y., is marketing a carbon remover which is a product of petroleum and which, so it is claimed, not only frees the motor of carbon, but leaves the motor thoroughly lubricated after the job is done. To keep the engine clean, the manufacturer advises the use of an ounce of the solution in each cylinder every 200 or 300 miles. The fact that the composition has an oil base makes it possible to run the engine after the carbon remover is applied without danger of damaging the cylinders, and also prevents the solution from getting past the pistons and spoiling the oil in the base, according to the makers. OpcO is the name of the product.

Plugs a Stewart Product

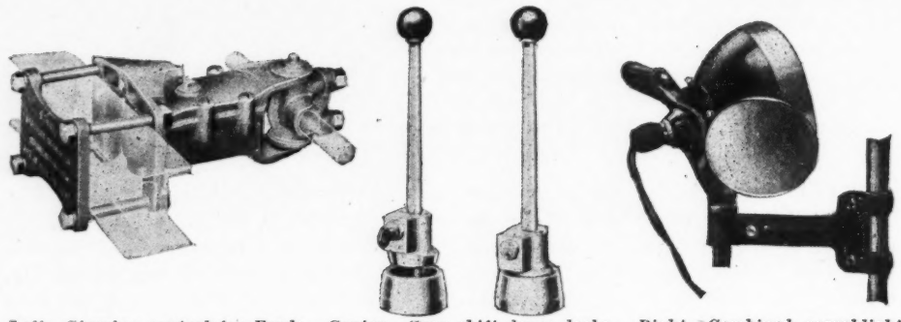
Following the announcement of the purchase of the V-Ray Co., Marshalltown, Ia., by the Stewart-Warner Speedometer Corp., comes the introduction of a new Stewart V-Ray spark plug coming as a product from the Stewart factories of Chicago. The porcelain core is made of a composition known as petriflint, the process for the manufacture of which is controlled by the makers. The material is said to be heat-proof, oil-proof and practically fracture-proof. Wire, used in the sparking points, is of such a nature that it will resist intense heat without burning or corrosion. There are four spark points on the plug to insure a continuous spark and prolong the life of the points. There is a novel method of cleaning the plug embodied. To clean the points the taper end of the terminal is slipped on the center point and turned with a slight pressure applied. The rasp-like surface scrapes the points, leaving them clean at the point the spark jumps. The retail price is $1.

Steering Control for Fords

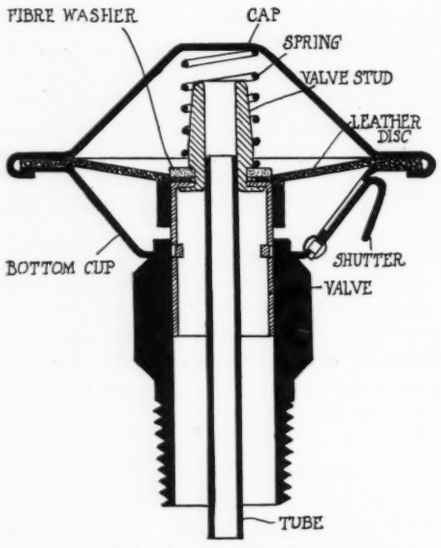
The Savidge device for Fords, made by the Savidge Co., Indianapolis, Ind., is a simply designed fixture of sturdy construction that is attached to the front axle and tie rod as shown in the illustration. All working parts are enclosed and operate in a bath of oil so that lubrication is automatic. The basic principle of the device is a variable cam controlling a heavy coil spring, giving accurate, graduated tension to the steering device according to the turning radius to which the wheels are set. The claim is that it will take any wobble out of the front wheels, act as a shock absorber on the steering column, and give positive control of the car at all times. The price is $4.90.

Electric Driven Horns

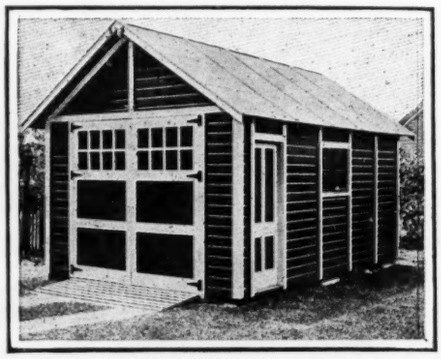
The American Electric Co., State and Sixty-fourth streets, Chicago, is marketing a variety of electrically operated horns at prices to meet different needs. The horn illustrated is motor driven and sells for $11. It has an overall length of 12¾ inches. The motors are designed to run at a high speed with minimum current consumption. Armatures are laminated steel, wound with silk-enamel wire impregnated with a moisture-proof compound and baked. A seven-segment copper commutator carries the current to the terminals through woven brushes with compensating springs. The field coils are impregnated and baked after taping to resist moisture. The large bearings are of phosphor bronze. The strike wheel is stamped out of steel and annealed. Other models sell at $10, $14 and $14.50.



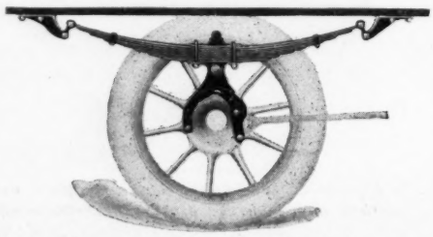
Left—Steering control for Fords. Center—Gear-shift lever locks. Right—Combined searchlight and mirror



Section through compensating vapor plug



Portable garage easy to erect



Rear auxiliary springs for Fords

Gear-Shift Lever Locks

The H-R neutralock, made by the H-R Mfg. Co., 1926 South Wabash, Chicago, is a device made to fit any type of sliding-gear shifting lever, and its purpose is to lock the lever into a neutral position. The lock fits over the shifting lever directly above the ball or H, whichever the construction may be. When unlocked it is situated high enough above the locking position to be out of the way, and when one desires to lock the car it is only necessary to push the lock down with the foot. Each lock has its individual key and cannot be unlocked with a master key. The price for H-type gearsets is $6.50, and for the ball-type, $7.50.

Portable Garages

Portable garages in types to fit practically every need of a private owner, are manufactured by F. C. Pinyoun & Son, Cleveland, O. The buildings are shipped to the consignee, knocked down, and, according to the manufacturers, the work of erection can be performed with the use of a few carpenter tools, every fixture being supplied complete by the maker. The side walls are made in sections on a strong frame. The sections contain the windows and doors complete. Roof types are optional. The makers can furnish gable, flat or side-gable, hip-roof, circle-roof, etc.

Prepared rubber roofing is regularly furnished. Floors are made in sections of matched pine laid upon sized and fitted joints. They are hung in iron stirrups. All partitions are placed to suit the owner's requirements. Upon order the houses can be furnished with steel frames. All lumber is ⅞-inch white pine, tongued and grooved. All hardware and fixtures are furnished.

Compensating Vapor Plugs

The Automatic Carbureter Co., 2019 Michigan avenue, Chicago, is the maker of the compensating vapor plug, a cross-section illustration of which will be found on these pages. The device screws into the manifold and its purpose is to feed fresh air to the gas charge coming from the carbureter in such proportions as to conduct a charge to the motor which will be most efficient as regards gasoline consumption and power developed. The action is automatic, air being sucked in by the action of the piston in quantities depending on the speed of the motor. The device retails for $5.

Rear Auxiliary Springs for Fords

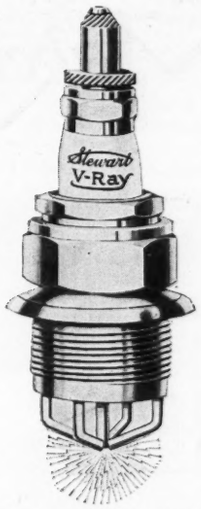
Camelford is the name of a spring assembly for attachment to the rear frame of Fords which converts the spring action into a half-elliptic platform suspension. It is, in reality, an assembly of two semi-elliptic springs suspended from the spring chair on the car and anchored to steel castings in the form of yokes which are attached to the rear axle at the inner surface of the hub. The attachment is particularly recommended when a Ford chassis is equipped with a commercial body. The yoke, spring chair, pad and spring hangers are of cast steel. The springs used are 44 inches long and 2 inches wide, with seven leaves. The price of the complete outfit is $40.

Combined Searchlight and Mirror

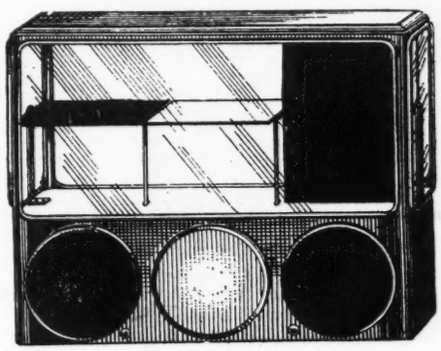
A new combined searchlight and diminishing mirror is announced by the Pittsburgh Electrical Specialties Co., Pittsburgh, Pa. The combination is known as the Pittsburgh five M, and consists of a 5-inch double curvature, parabolic reflector searchlight, with a 3½-inch diminishing mirror located on the side at the proper angle. One of the features of the searchlight is its outside focusing adjustment, which enables the use of any size or type of motor car lamp manufactured. Besides this feature of universal adaptability, the lamp can be focused in a moment's time to throw a sharp beam or broad beam, as desired. The retail price is $6. The price of the searchlight without mirror, known as the Pittsburgh five, has been reduced to $5.

Keyseater for Garages

The Fox lathe keyseating attachment, manufactured by the Sunderland Machinery Co., Omaha, Neb., converts a common lathe into a keyseater. With it as a part of a garage equipment, new axles, drive shafts and the like, can be made in the repair shop. The attachment will handle keyseats, Woodruff keyseats, and will do milling and slotting. The device consists of a steel spindle provided with centers at each end. One end of the spindle has a flat spot for the lathe dog and the other end is fitted with an oil cup to lubricate the tailstock center. A gear is mounted on this spindle and meshes into another gear which is fitted onto the driving end of the tool-steel cutter arbor. Both spindle and cutter arbor revolve in a housing of grey iron. The bearings in the housing are bored true to .001-inch and are ground to a high polish. The tool steel cutter arbor is 1-inch in diameter between the collars and will take standard size milling cutters. Two extra collars are furnished to take care of different width cutters. The arbor is fitted on the end as a chuck and will hold standard-size Woodruff cutters. A worm segment is secured to the face of the main housing, which meshes with a feed screw which is enclosed and held in place by a two-bearing cap. The list price of the complete device is $75.



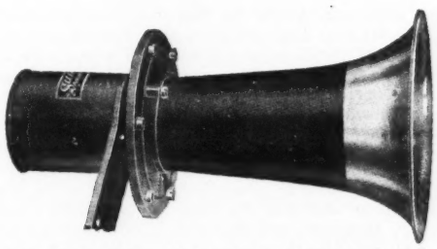
V-ray plug, a new Stewart product



Electrical safety device designed for attachment to the windshild

Electrical Safety Device

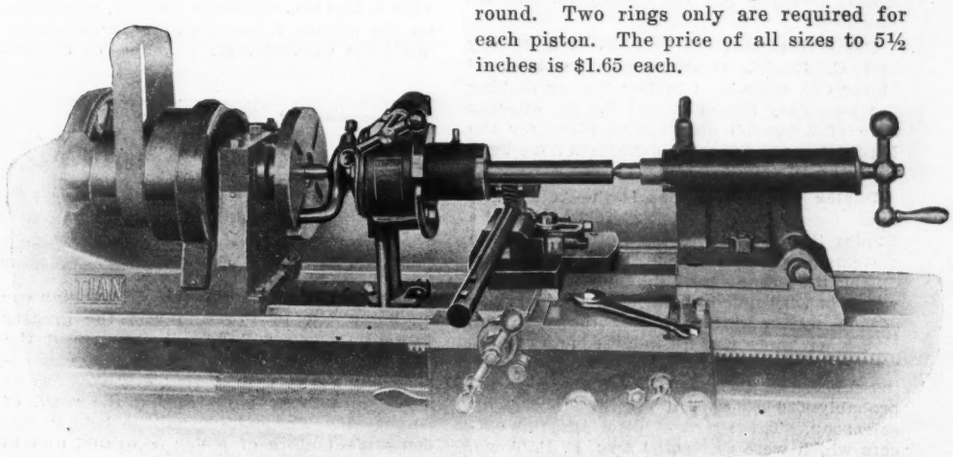
The Sherman-Crane Automobile and Signal Co., Minneapolis, Minn., is the producer of a new device, consisting of an electrical signal, for use in traffic signalling by the driver of a motor car. The signal consists of a box which is fastened to the windshield support on the driving side of the car. Signalling to show the direction of a turn is done by means of red and green lights. The driver can signify whether he intends to turn to the left or right, go straight ahead, semi-circle to the left or right, stop or back up. The horn may be wired to be automatically blown with the signal.



One of several models of motor-driven Sampson horns

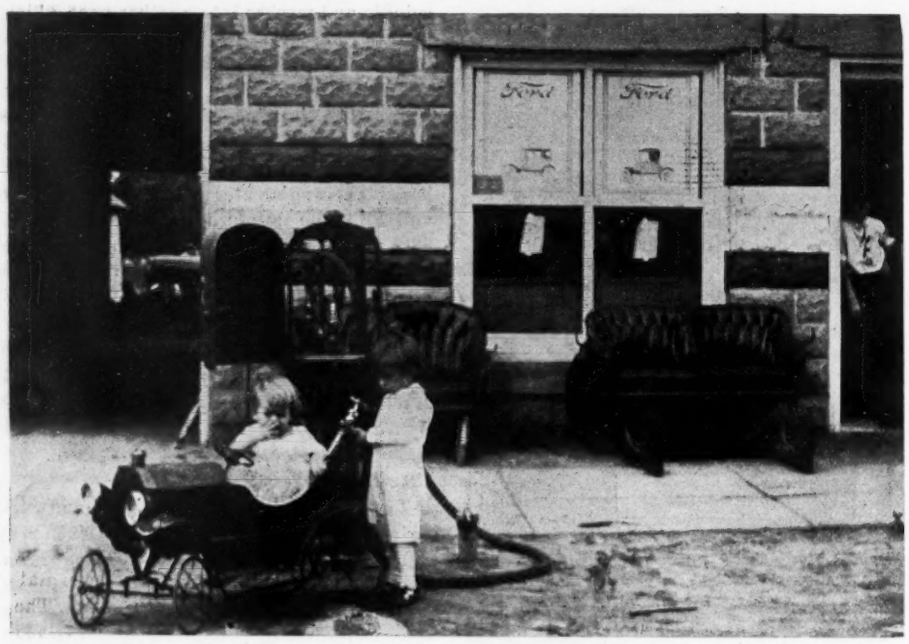
Hi-Comp Piston Rings

The Continental Piston Ring Co., Memphis, Tenn., is marketing a new high-compression piston ring. Two eccentric interlocking rings are combined to form a single concentric ring. The rings are made from soft gray iron and ground together. It is not necessary to take the rings apart as they expand sufficiently to fit over the piston. The design of the ring is said to give an equal expansive power on all parts of the cylinder, even though worn out of round. Two rings only are required for each piston. The price of all sizes to 5½ inches is $1.65 each.



Keyseating attachment for application to an ordinary lathe

Among the Makers and Dealers



Two young hopefuls are Ford owners in Cawker, Kan.

HANSON with Detroit Commercial Car—A. B. Hanson, formerly general manager Service Motor Truck Co., has become vice president and general manager of the Detroit Commercial Car Co.

Oskaloosa Dealer Expands—The Lewis Brothers Co., Oskaloosa, Ia., has taken over all the former interests of the Schee Company, now of Des Moines, including the sales department, the Buick line, and the Packard sales right.

Jones Heads Federal Brass Sales—The Federal Brass Works, Detroit, Mich., has made Lloyd P. Jones sales manager. For the last 5 years Mr. Jones has been connected with the American Bronze Co., and since 1913 has been manager of the western office.

Pullmans in West—I. H. Snider has taken the entire agency for Pullman cars, distributing over Kansas, Oklahoma, Arkansas, and Missouri. The firm will operate under the name of the Herff-Brooks Motor Co. Mr. Snider formerly had the agency for Milburn electrics.

Des Moines Maxwell Branch—C. R. Newby and C. Reidel, representing the Maxwell Motor Co., have been in Des Moines making the necessary arrangements for the opening here of a branch distributing plant for the Maxwell cars. Office headquarters have been located.

Duplex Power Earnings High—At the annual meeting of the stockholders of the Duplex Power Car Co., Charlotte, Mich., the statement was made that the net earnings during the fiscal year 1916 totaled $41,110.03, which is very much better than the previous season was, and also better than 3 years ago, when there was an indebtedness of over $30,000. Stockholders present at the meeting subscribed about $20,000 of new stock and probably $30,000 worth will be offered for sale soon. The board of directors and officers which were re-elected are: F. P. Town, president; F. S. King, vice-president; Fred Murray, secretary; H. H. Bryan, treasurer. Allen White, J. H. Brown and William Cooley are the other directors.

Continental to Add—The Continental Motor Co., Muskegon, Mich., will increase its plant, and work is to be started at once upon a one-story, saw-tooth machine shop addition, which is to add nearly 30,000 square feet floor space to the plant.

Schwarz Wheel to Expand—The Schwarz Wheel Co., Philadelphia, Pa., has purchased 6 acres at Holmesburg near its present plant for extensions. The close of the fiscal year showed the greatest volume of business ever done. All the officers were re-elected.

Hastings Goes to Europe—D. T. Hastings, formerly on the engineering staff of the General Motors Co., is now engineer for the Empire Automobile Co., Indianapolis, Ind. Mr. Hastings left General Motors some time ago and he has also been connected with the engineering work of the Packard and Hupp companies in the past.

Consolidate for Economy—The Connersville Wheel Co., Connersville, Ind., is winding up its affairs preparatory to consolidation with the Central Mfg. Co., also of Connersville. The stockholders of both companies are largely identical, and by combining under one management, it is expected to effect certain economies.

The Show Circuit

Portland Show This Week—The motor car buying public of Portland and the greater part of Oregon will be able to inspect the new models of the various lines represented, when the dealers of that city stage their first mid-summer show during the week of August 21. The exhibit will be held in the department store of Meier & Frank, and 18 different Portland companies will be represented.

Carr Company Adding—The F. S. Carr Co., of Boston, Mass., maker of Neverleak, is about to put up two new buildings, and work will be started at Framingham at once.

Ford Duluth Branch—The Ford Motor Co. has opened a factory branch at Duluth, Minn., in a building of four stories and basement. H. A. Netter, of Milwaukee, is manager and R. W. Foster, of Minneapolis, assistant manager. There are six salesmen and fifty employes connected with the branch which will store and repair cars. The territory is northern Minnesota and northern Wisconsin.

Drake Returns From Orient—After an extended trip through Japan, China and Australia, Joseph R. Drake, vice-president of the Hupp Motor Car Co., Detroit, Mich., is again in Detroit, being accompanied by R. F. Cole, representative of the Hupp company in the Orient. Mr. Drake has made a number of world tours in the interests of his company and reports conditions very favorable for extension of American car selling in those countries he visited.

Oakland Will Expand—There will be about 800 more men on the payroll of the Oakland Motor Car Co., Pontiac, Mich., within the next few months, when large additions to the plant will be completed. Recently ground and a number of lots and houses near the factory have been bought for this purpose. One of the most important additions will be a large one-story, saw-tooth machine shop, which will practically double the capacity of the present shop.

Wahlberg Will Engineer Jeffrey—N. E. Wahlberg, chief engineer of the Oakland Motor Car Co., has resigned to become associated in a similar capacity with the Nash Motors Co., Kenosha, Wis., the new organization headed by C. W. Nash, formerly general motors president, which company is to manufacture Jeffrey cars. Mr. Wahlberg has been with the Oakland company for a number of years, first as assistant engineer and later as head of the engineering work.

Gillette Tire Production Oct. 1—The Gillette Safety Tire Co., Eau Claire, Wis., will probably be able to start manufacturing operations on October 1, if the progress made in the construction and equipment of the $75,000 plant during the next 40 or 50 days is carried on with the same facility as during the last 2 months. The buildings are inclosed and the interior work and foundations for machinery are now being constructed. Equipment is already arriving from the Adamson Machine Co., Akron, O. The first unit of the plant will have an output of 150 tires daily.

Falls Motors Not to Move—The Falls Motors Corp., which succeeded the Falls Machine Co., on August 1, has definitely decided not to remove the plant from Sheboygan Falls, Wis., to Cleveland, O., or other cities which have made flattering offers to the concern. At a special meeting of the board of directors it was voted to remain at Sheboygan Falls and undertake as soon as possible the erection of additional buildings required to bring the capacity up to the requirements of contracts now on the books. A large assembly shop, 250 feet long, has

been completed and work will be started at once on an addition, 120 by 180 feet.

Bower Bearing Divident 60 Per Cent—As evidence of the prosperous condition of the Bower Roller Bearing Co., manufacturer of the Bower roller bearing, the stock of the company was placed on a 60 per cent dividend basis at a recent meeting of the board of directors. In other words, a dividend of 15 per cent was declared and it was styled a quarterly disbursement.

Deere Buys Tractor Patents—James Griffin and Bernard O'Donnell, both of Sheldon, Ia., recently issued patents upon a corn plow tractor, have disposed of their rights to the Deere Plow Co., of Moline, Ill., for a sum said to be $25,000, and will be paid a royalty upon each machine sold. The tractor has many new features, one of the most important being the ability of the manufacturer to sell it at a price of about $300. One man can operate the machine, controlling the plows with his feet.

Covert Enlarges Plant—One new building completed and the machinery partly installed, construction work well started on a second, and plans for a third under way is the building activity of the Covert Motor Vehicle Co., at Lockport, N. Y. Since the announcement a short time ago of the re-incorporation of this company with a capital of $1,000,000 and of the new name, every energy has been centered in the development of the new model transmissions that are forthcoming this year.

Wager Matco Advertising Manager—F. A. Wager has been appointed sales and advertising manager of the Michigan Auto Trailer Co., Detroit, Mich., builders of both light and heavy trailers for cars and trucks.

Y. M. C. A. Truck Instruction Course—A night school of instruction for motor truck drivers has been started by the Houston Y. M. C. A., Houston, Tex. Instruction is free.

Cleveland Directory Shows Car Owners—The new directory published by the Cleveland Automobile Club, Cleveland, O., contained the names of 31,000 car owners in Cuyahoga county, with the numbers of their licenses.

Bour Leaves Advertising Company—Charles J. Bour, president of the Bour-Davis Motor Car Company, of Detroit, Mich., and former head of the National Railway Advertising Company, of Chicago, has become so interested in the motor car business that he has disposed of his interests in the Chicago company.

Bradley Institute's Motor Course—The Bradley Institute of Technology, Peoria, Ill., has decided to continue its course in motor engineering and this will begin September 13. The course has been considerably augmented since it was begun a year ago and will include everything required by students relative to the care of the car, driving, repairs and the construction of the car.

Boulden Leaves Chase—H. T. Boulden has resigned as sales and advertising manager of the Chase Motor Truck Co., Syracuse, effective September 1, to become sales director of the Selden Truck Sales Co., Rochester, N. Y. He will be succeeded in the Chase organization by B. E. Blackley, who has been Boulden's assistant.

Solve Truck Employe Housing—The Four Wheel Drive Automobile Co., Clintonville, Wis., has found it necesesary to bring several hundred workmen to Clintonville, Wis., and that city is confronted by a serious housing problem. To afford relief business men have formed the Home Building Co., with $25,000 capital, and will erect a large number of cottages, to be leased or sold practically at cost.

Kissel Adding Two Buildings—Approximately 14,000 square feet of floor space will be added to the plant of the Kissel Motor Car Co., Hartford, Wis., at once. Contracts have been let for the enlargement of the sheet metal and body building shops, and work is well under way. The new buildings are 77 by 123 and 40 by 100 feet.

Parrett Moves to Peoria—The Parrett Machine Co., Wenona, Ill., which has been engaged in the manufacture of the Parrett farm tractor for several years, has removed to Peoria, Ill.

Recent Incorporations

Akron, Ohio—The General Tire & Rubber Co., increase of capital from $200,000 to $500,000.

Albany, N. Y.—Willis Truck & Tractor Co., Inc.; motors, motor cars, tractors; capital stock, $12,500,000; incorporators, F. N. Campbell, J. L. Sullivan, J. J. McGovern, B. Slater.

Cincinnati, O.—Edmon Accessory Co., to deal in motor car accessories; capital stock, $100,000; incorporators, T. C. Christie, E. A. Edmon, Gertrude Edmon, Grace Christie, Lawrine Christie.

Cleveland, O.—American Auto Trimming Co.; capital stock, $100,000; incorporators, B. Gotfredson, F. Joyce, G. A. Coulton, F. W. Treadway, W. H. Marlatt.

Cleveland, Ohio—The Smith Bearing & Manufacturing Co.; capital stock, $10,000; incorporators, Mark A. Copeland, F. B. Evarts, George A. Mowery, C. E. Schulz and C. Verbsky.

Cleveland, Ohio—The Motor Products Co., to manufacture accessories; capital stock, $35,000; incorporators, Clifford S. Goby, C. F. McConnell, H. E. Gresham, G. C. Hafley and H. H. Kraus.

Cleveland, Ohio—The Ohio Trailer Co., to manufacture trailers; capital stock, $35,000; incorporators, William M. Byrnes, J. S. Burke, E. C. Spader, Nevada Ficht and Charles A. Burke.

Cleveland, Ohio—The McKay Co., to manufacture automobile rims; capital stock, $25,000; incorporators, Albert R. Warner, Stewart R. McKay, Edwin L. Thurston, Arthur F. Kwis and Arthur J. Hudson.

Cleveland, Ohio—The Savage Auto & Repair Co.; capital stock, $5,000; incorporators, W. C. Davies, H. D. Savage, Walter McMahon, Marcus Cohen and M. J. Rowan.

Chillicothe, O.—Arbenz Motor Car Co., to manufacture motor trucks; capital stock, $1,000,000; incorporators, M. F. McFadden, E. C. Spader, M. C. Hayes, W. J. Purcell, R. I. Pillars.

Columbus, O.—The Clarke Auto & Tire Co., Youngstown; capital stock, $5,000; incorporators, Helen Clarke, Caroline S. Bonnell, Charles A. Bonnell, Archibald Clarke and Talcott P. Clarke.

Dallas, Tex.—Lamberth Motor Co.; capital stock, $5,000; incorporators, J. S. Lamberth, D. D. Rogers, J. M. Cooper.

Dallas, Tex.—Dallas Oakland Sales Co., service station and sales department; incorporators, J. P. Kelley, A. C. Schmidt.

Decatur, Ill.—Decatur Taxi Co., to do a general taxicab and garage business. A repair shop will be conducted and a line of supplies carried; capital stock, $5,000; incorporators, A. W. Moore, G. N. Mason and Sherman Sox.

DePere, Wis.—The Broadway Garage, garage, repair shop and agency; capital stock, $10,000; incorporators, G. T. McGeehan, Bridget McGeehan, Margaret McGeehan.

Detroit, Mich.—Greer Carbureter Co., to make carbureters; capital stock, $30,000; incorporators, Frank J. Ross, Phelps M. Greer and Paul B. Moody.

Detroit, Mich.—George W. Franklin Co., motor car dealers; capital stock, $15,000; incorporators, George W. Franklin, Frederick A. Vollbrecht and Thomas H. Walker.

Detroit, Mich.—Michigan Radiator & Fender Repair Co., to do a general radiator and fender business; capital stock, $1,000; incorporators, Harry Caplan, A. Eilene, S. Sanders and Walter Phillips.

Detroit, Mich.—Elite Garage Co.; capital stock, $10,000; incorporators, Virginia Grese, Edward S. Grese and Wm. C. Aldridge.

Detroit, Mich.—McCord Mfg. Co.; capital stock increased from $1,000,000 to $2,500,000.

Grand Rapids, Mich.—Auto Light Control Co., to manufacture automobile light controls and specialties; capital stock, $25,000; incorporators, Paul Nissen, Walter Kalzoe and G. W. Stolz.

Huntington, W. Va.—Live Avery Motor Car Co., to deal in motor cars; capital stock, $10,000; incorporators, H. E. Love, H. Lamb, P. E. Avery.

Indianapolis, Ind.—Farmers' Mutual Insurance Co., insurance directors; incorporators, A. F. Wood, W. H. Stanley, J. E. Armstrong, W. R. Wood, M. F. Holman.

Jefferson City, Mo.—Overland-Springfield Motor Co., garage; capital stock, $10,000; incorporators, C. W. Lehnhard, A. F. Lehnhard, W. W. Lehnhard.

Kokomo, Ind.—Jay, Williams & Co., to deal in motor cars and accessories; capital stock, $2,000; incorporators, J. P. Jay, T. B. Jay, C. L. Williams.

Kokomo, Ind.—Progressive Motor Car Co., to deal in motor cars; capital stock, $10,000; incorporators, J. L. Sterling, E. C. Teter, C. S. Goodfellow, N. T. Miller, E. Cox.

Kansas City, Mo.—A. B. D. Motor Co., to manufacture and deal in motor vehicles; capital stock, $50,000; incorporators, E. Bierworth, A. W. Ayler, K. L. Davy, W. M. Goodrich, M. E. Green.

London, Ohio—The London Auto Sales Co., to sell automobiles and accessories; capital stock, $10,000; Frank B. McKee, Ellen McKee, Lydia McCall, Arthur McKee and Charles F. McCall.

Louisville, Ky.—Callahan-Whiteside Motor Co.; capital stock, $20,000; incorporators, W. P. Callahan, A. H. Whiteside, B. B. Raudebaugh.

Madison, Wis.—The Briscoe Co. of Wisconsin, to deal in new and used cars, operate a garage, etc.; capital stock, $50,000; incorporators, Glenn W. Stephens, Ethel Lee and Louis C. Horner.

Milwaukee, Wis.—The Siegel Garage & Service Co., to operate a garage, repairshop, deal in cars, accessories, etc.; capital stock, $2,000; incorporators, Louis, Nell, David and Etta Siegel.

Milwaukee, Wis.—West Side Buick Co., to deal in new and used cars; capital stock, $10,000; incorporators, E. M. Jordan, W. S. Schurman, L. M. Jeger, A. J. Klingelhoefer.

Milwaukee, Wis.—Turbo Carbureter Co., to manufacture and market engines; capital stock, $10,000; incorporators, I. M. Smith, Gladstone Cherry, M. L. Fykes.

Milwaukee, Wis.—Badger State Oil Co.; capital stock, $225,000; incorporators, A. J. Eberhardt, F. F. Wolfgram and M. H. Shekley.

Minot, N. D.—McKinney-Fuller Co., to succeed the Northwest Motor Co.; capital stock, $100,000; incorporators, C. A. McKinney, M. L. McKinney, A. H. Fuller.

Napoleon, O.—Napoleon Crown Fender Co.; capital stock, $20,000; incorporator, G. M. Donnelly.

New York—Owners' West 66th Street Garage, Inc.; capital stock, $90,000; incorporators, R. C. Culver, F. L. Gibbs, S. G. Meeker.

New York—Hesletine Motor Corp., to acquire and take over the business of the Gadabout Motor Motor Corp.; capital stock, $10,000,000; incorporators, N. P. Coffin, C. M. Egner, H. T. Farrow.

New York—White Motor Sales Co., to buy, sell and deal in motor cars and accessories; capital stock, $50,000.

New York—Republic Motor Truck Co., to manufacture motor cars and accessories; capital stock, $1,312,500; incorporators, C. B. Bellows, E. C. King, H. W. Smith.

New York—Duryea Motors Co., to manufacture and deal in motors; capital stock, $100,000.

Pittsburgh, Pa.—Oberlin Motor Truck Co., to manufacture motors, motor cars; incorporators, J. F. Callahan, J. R. D. Huston, F. M. Neeper.

Philadelphia, Pa.—Blackstone Motor Co.; capital stock, $100,000; incorporators, M. L. Rogers, L. A. Irwin, H. W. Davis.

Philadelphia, Pa.—Home Service Garage; capital stock, $10,000; incorporator, James Henry, Jr.

Saginaw, Mich.—Nissen-Kalzoe Co., automobile dealers; capital stock, $2,000; incorporators, Marshall D. Elgin, A. A. Flory, U. H. Davenport.

Springfield, Mass.—Williams Motor Sales Co.; capital stock, $10,000; incorporators, H. C. Williams, A. Vogel, P. A. Williams, Jr.

Seattle, Wash.—Alman-Crosby Motors Co., Inc.; capital stock, $100,000; incorporators, J. O. Alman, R. W. Crosby.

St. Louis, Mo.—Scudder Motor Truck Co., general motor car business; capital stock, $10,000; incorporators, C. M. Polk, C. R. Scudder, L. M. Amrine.

Trenton, N. J.—Cut Price Auto Tire Co., to deal in motor cars and accessories; capital stock, $100,000.

Toledo, Ohio—The F. R. Mitchell Co., to deal in automobiles; capital stock, $25,000; incorporators, F. R. Mitchell, W. B. Morgan, Stanley J. Hiatt, C. B. Hughes and H. A. Keeler.

Toledo, Ohio—The U. S. Mail Contracting Co., to operate an auto livery concern; capital stock, $60,000; incorporators, W. W. Campbell, J. C. McFallin, W. E. C. Rentschler, Dreier, M. H. Helwig.

Youngstown, Ohio—The Henderson Overland Co., to deal in automobiles; capital stock, $100,000; incorporators, James A. Henderson, William Henderson, A. M. Henderson, A. G. McGuire and William E. Hill.

From the Four Winds

OREGON Registrations 30,504—Receipts of the Oregon state vehicle department for the first 7 months of 1916 totaled $132,044.50, compared with $108,881.50 for the entire 12 months of 1915. A steady increase in the number of motor vehicles in Oregon is shown. Last year there were 23,585 cars, while this year, with 5 months yet remaining there are 30,504 registered.

Kansas City Has 12,100 Cars—City motor licenses issued in Kansas City, Mo., to August 12 totalled 12,100. This is more than 2,000 above the number issued last year, when the total was somewhat under 10,000. The city license inspector ordered 12,000 tags at the beginning of the year, thinking this would suffice. It is now found necessary to get 2,000 additional tags.

Texas County Has 717 Cars—Caldwell county, of which Lockhart is the county seat, claims more miles of good roads and more cars to its size than any other county in Texas. The Lusling district and the Martindale district are now spending, respectively, $50,000 and $10,000 on road improvements, and Lockhart is coating its roads with a dust-layer. Nearly $170,000 has been spent in Lockhart for cars since January 1, the registration to date being 717.

Salesmanship Course at Columbia—Columbia University plans a course in salesmanship, which coincides with the idea which played such a big part in the recent World's Salesmanship Congress. A new business school is to include courses in selling, advertising, sales management, business English and commercial correspondence. It is planned to make the instruction practical and of immediate value to young men already engaged in business vocations. The course will be 3 years.

Mississippi's New Traffic Law—At the recent session of the Mississippi legislature, a new state traffic law was passed. A speed limit of 30 miles an hour is provided for country roads and 15 miles in incorporated towns. Where the road is less than 20 feet in width, however, the rate is 10 miles per hour, while when passing a person walking the motorist must limit himself to 8 miles. This applies also to passing a schoolhouse during school hours or a church during services. The law requires the use of mufflers inside towns. The usual road regulations are given. Penalties for violation are a maximum of $100 or 10 days in jail and a minimum of $10 for first violation, $25 to $200 or 20 days, on second violation, and $25 to $200 or 30 days for succeeding infractions.

Good Roads Activities

Crater Lake Road Open—The government road to the rim of Crater Lake, Ore., now is open for travel. The road was cut through huge snow drifts in places. A crew of men has begun work on the road which the government is building around the rim of Oregon's wonderful lake.

Good Roads League Formed—The Adams County Good Roads League has been organized at Quincy, Ill., with a view of conducting an educational campaign to pave the way for a vote on road bonds. More than 50 delegates attended the organization meeting in the Chamber of Commerce here Wednesday. Oscar Arntzen was made permanent chairman and C. F. Perry, secretary. Township vice-chairman were named. Practically all of the business men in the country were enrolled as members at the meeting.

COURTERS MUST NOT BE DISTURBED—The police of Parsons, Kan., have warned motorists against unnecessarily throwing the glare of their searchlights on to porches and secluded nooks. The police say that some motorists have been maliciously disturbing the peace of young people who have found presumably sheltered nooks for love-making, and that the preservation of our civilization, and the maintenance of our integrity as a nation, to say nothing of the continuance of male and female of the species in the rightful pursuit of life, liberty and happiness, depend very largely on courting.

Ask Federal Road Funds—The county commissioners of Wyandotte, Douglas, Leavenworth, Johnson and Shawnee counties will make formal request for their share of the $143,000 appropriated for road building in Kansas this year under the recent federal good roads act. This was the decision of those attending a meeting of the Kaw Valley Improved Highway Association and representatives of the counties. The road for which the money will be asked will be from Fort Leavenworth to Fort Riley.

New Minnesota Road Body—The Minneapolis Scenic Highway Association has been organized at Detroit, Mich. Scenery of northern Minnesota will be touted by this organization, including Duluth and the iron range country. The emblem is a white star on a blue background and surrounded by the words, Minnesota Scenic Highway. This is emblematic of the North Star state.

Texas' Federal Fund Plans—Already plans are on foot to use Texas' share of the federal appropriation of $5,000,000 for good roads. It is the plan of D. E. Colp, secretary of the Texas Good Roads Association, to use this money in building a model road from Dallas to Mineral Wells, by way of Ft. Worth and Weatherford, using the Tarrant county road system as a part of the road. Secretary Colp says he finds very little opposition to the creation of a state highway commission.

Coming Motor Events

TRACTOR DEMONSTRATIONS

Aug. 28-Sept. 1—Indianapolis, Ind.
Sept. 4-8—Madison, Wis.

SHOWS

September 4-8—Hartford, Conn.
September 4-9—Minneapolis, Minn., fall show.
September (date undecided)—Cleveland.
September 25-30—Salem, Ore.
October 2-7—St. Louis, Mo., show week.
October 14-31—Dallas, Tex.
January 6-13—New York show.
January 13-20—Montreal.
January 27-February 3—Chicago show.
February—St. Louis, Mo., show.
February 3-10—Minneapolis, Minn., show.
March 3-10—Boston.

With the Motor Clubs

Milwaukee Club's Orphan Outing—The Milwaukee Automobile Club, Milwaukee, Wis., will hold its tenth annual orphans' outing at Washington park, Milwaukee, on Thursday, August 24. Faustin Prinz has been appointed chairman of the committee in charge. Between 500 and 600 parentless children will be entertained.

Largest Club in Pennsylvania—The Automobile Club of Delaware county, Pa., recently passed the 2,000 membership mark after a strenuous campaign, and is now the largest in Pennsylvania, besides one of the most active. The campaign will be extended, however, and an effort will be made to reach the 2,500 mark.

Club Warns of Speed Traps—The Columbus Automobile Club has issued warnings of speed traps at Lafayette, Grove City and Mt. Sterling, O. The traps have been in operation for some time and quite a few motorists have been caught. The club has decided to issue bond cards to wives and daughters of members of the club, which will eliminate a visit to the police station in case of arrest.

Ohio Bodies' Merging Plans—A meeting of the Columbus Automobile Trade Association and the Columbus Garage Owners' Association, Columbus, O., has been called to meet soon, when steps will be taken to merge the two organizations. The movement for merging the associations has been hanging fire for some time, being delayed by the vacation period. The majority of the members of both organizations are favorable to the merger.

Ott Leaves Nashville Club—John M. Ott, secretary of the Nashville Automobile Club, Nashville, Tenn., has resigned his position to become a salesman for the Burton Automobile Co., distributors of the Stearns-Knight car in middle Tennessee. Mr. Ott introduced a number of reforms in motor conditions in Nashville. One of his most important achievements was that of making a road-map of the county with full data for motorists. He has been succeeded by Charles Peay.